



**28 SEPTEMBER 2012**

***Maintenance***

***AIR AND SPACE EQUIPMENT  
STRUCTURAL MANAGEMENT***

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

---

**ACCESSIBILITY:** Publications and forms are available on the e-Publishing website at [www.e-publishing.af.mil](http://www.e-publishing.af.mil) for downloading or ordering.

**RELEASABILITY:** There are no releasability restrictions on this publication.

---

OPR: NGB/A4MM

Certified by: NGB/A4 (Col Ogle)

Pages: 51

---

This instruction provides procedural guidance to establish and support the Corrosion Prevention and Control, Non Destructive Inspection (NDI) and Advanced Composites maintenance programs. It implements policy in AFRPD 21-1, *Air and Space Maintenance*. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/>.

Air Force Instruction (AFI) 20-114, *Air and Space Equipment Structural Management*, 7 June 2011. This instruction establishes objectives, and assigns responsibilities for implementing and maintaining an effective Corrosion Prevention and Control Program, Nondestructive Inspection Program (NDI), and Low Observables (LO) on Air Force systems, equipment, and components in the Air National Guard. NGB/A4MM is the office of primary responsibility (OPR) for requests for deviations or waivers from the requirements of this instruction. This publication is applicable to all ANG units and takes precedence over Gaining Command Corrosion Instructions.

***SUMMARY OF CHANGES***

This publication is a revision of AFI 21-105\_ANG SUP, *Air and Space Equipment Structural Management*, 22 April 2011 and defines and incorporates changes in corrosion prevention and control, low observables, aircraft washing, corrosion training, maintenance painting, and aircraft markings. This publication incorporates the following revisions: Addition of Low Observable Aircraft Structural Maintenance section 4 and attachment 6, 7, 8, 9, 10, 11 and 12.

1.	PROGRAMS. ....	2
2.	ROLES AND RESPONSIBILITIES. ....	3
3.	UNIT CORROSION CONTROL PROGRAM. ....	4
4.	Low Observable Aircraft Structural Maintenance (AFSC 2A7X5). ....	8
5.	General Corrosion Prevention and Control. ....	12
6.	Washing Aircraft. ....	12
7.	Corrosion Prevention and Control Training. ....	13
8.	Maintenance Painting. ....	13
9.	AIRCRAFT MARKINGS ....	14
10.	Unit Nondestructive Inspection Program. ....	14
<b>Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION</b>		<b>16</b>
<b>Attachment 2—AIRCRAFT POST WASH CORROSION INSPECTION</b>		<b>18</b>
<b>Attachment 3—AIRCRAFT POST-WASH CLEANLINESS INSPECTION</b>		<b>21</b>
<b>Attachment 4—AIRCRAFT PRE-WASH SUPERVISOR’S GUIDE</b>		<b>24</b>
<b>Attachment 5—SUPERVISOR’S SAFETY BRIEFING</b>		<b>25</b>
<b>Attachment 6—ANG AIRCRAFT MARKINGS</b>		<b>26</b>
<b>Attachment 7—TYPICAL ANG TAIL MARKING CONFIGURATIONS:</b>		<b>42</b>
<b>Attachment 8—COATING GRID CHECK CHECKSHEET</b>		<b>45</b>
<b>Attachment 9—F-22 OUTER MOLD LINE AUDIT</b>		<b>46</b>
<b>Attachment 10—DAILY SAS REPORTING METRICS</b>		<b>48</b>
<b>Attachment 11—SAS CREEP DESCRIPTION</b>		<b>49</b>
<b>Attachment 12—SAS MARGIN DEFINITION</b>		<b>51</b>

**1. PROGRAMS.** The Air Force will provide optimum support to structural maintenance programs to maintain air and space equipment in a safe, serviceable and ready condition. This guidance addresses four key structural maintenance programs: NDI, Advanced Composites, Corrosion Prevention and Control and Low Observable Coatings. The programs support all functions that acquire, modify, or maintain air and space systems.

1.1. NDI. The NDI Program assesses the structural integrity of air and space systems and equipment by detecting defects (i.e., cracks, voids), delaminations, and foreign objects, and measuring properties such as material thickness, bond-line integrity, material composition and corrosion.

1.2. Advanced Composites. The Advanced Composites Program addresses repair and supportability issues for air and space systems containing advanced composite materials.

1.3. Corrosion Prevention and Control. The Corrosion Prevention and Control Program ensures structural integrity of air and space systems and supporting equipment by preventing, assessing, detecting and controlling the damage and effects of corrosion.

1.4. Low Observable Coatings. Technologies to control the radar, infrared, visual, and acoustic signatures for reducing threat sensor detection

## **2. ROLES AND RESPONSIBILITIES.**

2.1. NGB/A4MM is the command manager for NDI, Advanced Composites, and Corrosion Prevention and Control functional programs.

2.2. Command Functional Manager (NGB/A4MM) Responsibilities:

2.2.1. Represents the Command and supports the Corrosion Prevention Advisory Board (CPAB), Advance Composite & LO Working Group/Maintainer, NDI & Metals Technology meetings for the assigned weapons systems.

2.2.2. Validates that a SPOC per weapon system to represent the program manager in these disciplines at the various meetings is appointed IAW AFI 21-101\_ANGSup, Chapter 19

2.2.3. Encourages Corrosion, Advance Composite, LO, NDI, and Metal Tech support from field units.

2.2.4. Ensures that adequate technical training is available for Aircraft Structural Maintenance (ASM) personnel in AFSC 2A7X3 and Low Observable Aircraft Structural Maintenance (LOASM) personnel in AFSC 2A7X5.

2.2.5. Supports and provides technical expertise for Utilization and Training Workshops to ensure that training requirements are current.

2.2.6. Coordinates training requirements with Air Education and Training Command (AETC) to facilitate course scheduling/attendance.

2.2.7. Stresses the importance of an effective Corrosion Control for the Command, and assists subordinate units in developing effective training programs.

2.2.8. Advocates the importance of communication between Unit Corrosion Managers and weapon system SPOCs.

2.2.9. Coordinates with Air Force Materials Command (AFMC) in the development and testing of new and improved materials, processes, and equipment.

2.2.10. Coordinates and supports the Air Force Corrosion Program Office (AFCPO) by participating in field surveys, DOD and AF Corrosion Manager Meetings, Corrosion Advisory Boards, and equipment evaluations.

2.2.11. Validates a SPOC to serve as a central coordinator for all ANG NDI Laboratories is appointed IAW AFI 21-101\_ANGSup, Chapter 19

2.2.12. Represents NGB/A4M at DOD/Air Force NDI/OAP conferences and meetings.

2.2.13. Conduct periodic Command NDI meetings and provide equipment and NDI program status briefings.

2.2.14. Ensures adequate technical training is current and available for NDI/OAP Program.

2.2.15. Identify training requirements to the AETC to facilitate course scheduling/attendance for NDI/OAP Program.

2.2.16. Supports the Air Force NDI/OAP Program Office by participating in NDI/OAP equipment evaluations, field evaluations, NDI/OAP Integrated Process Teams, NDI/OAP Product Improvement Teams, NDI/OAP Managers meetings, and advisory boards.

2.2.17. Ensures the allocation and distribution of NDI/OAP resources to meet ANG mission requirements.

### **3. UNIT CORROSION CONTROL PROGRAM.**

#### **3.1. Maintenance Group Commander Responsibilities:**

3.1.1. Ensures the Unit has an effective Corrosion Prevention and Control Program.

3.1.2. Publishes Local Supplements to this instruction.

3.1.3. Appoint a highly qualified NCO with appropriate technical background and corrosion control experience to serve as the Unit Corrosion Prevention and Control Manager.

3.1.4. Ensure that a corrosion-training program is established.

3.1.4.1. Ensure all personnel involved in aircraft maintenance receive corrosion control (initial and refresher) training, and meet safety and health requirements, as set forth under the Occupational Safety and Health Administration (OSHA).

3.1.5. Establish procedures for periodic cleaning of aircraft and support equipment, IAW applicable publications.

3.1.6. Ensure that the Unit Corrosion Manager participates in Command and Weapon System Corrosion Prevention and Control Programs.

3.1.7. Ensure that funding for facilities, manpower, equipment, and materials to support a sound Corrosion Control Program are identified and requested. Minimum requirements are:

3.1.7.1. Ensure that an adequate corrosion control facility is available to wash aircraft, perform minor maintenance, and paint assigned aircraft. In addition, ensure that adequate back shop space is available to accomplish corrosion treatments and paint requirements for support equipment (SE) and aircraft parts.

3.1.7.2. Ensure facility-control technology meets both local, state, and federal Environmental Protection Agency requirements and National Emission Standards for Hazardous Air Pollutants (NESHAP).

#### **3.2. Unit Corrosion Manager Responsibilities:**

3.2.1. Organizes and manages the Corrosion Prevention Program IAW applicable publications.

3.2.2. Establish a corrosion-control training plan.

3.2.3. Ensure initial and refresher training is provided to aircraft maintenance personnel.

3.2.4. Verify that approved materials and equipment are used to support the Corrosion Control Program. Ensure corrective action is taken when discrepancies are noted.

3.2.5. Attend weapon(s) system CPAB, or send a designated representative. Requirement may be filled by MDS SPOC.

3.2.6. Attend DOD, Air Force, and ANG Corrosion Program Manager meeting and workshops. Requirement may be filled by MDS SPOC.

3.2.7. Coordinates with all aircraft maintenance functions for recommendations or suggestions that would enhance corrosion prevention and structural integrity of the assigned aircraft.

3.2.8. Submits CPAB action-items to the weapons-system corrosion SPOC or contractor support for review and coordination with MAJCOM and ALC Corrosion Managers.

### 3.3. ASM and LOASM Supervisor Responsibilities:

3.3.1. Ensure that corrosion inspections are accomplished during each phase/periodic inspection for aircraft by using weapon system-6 work cards or a locally devised work deck.

3.3.2. Ensure personnel complete a visual corrosion inspection after each aircraft wash using the Aircraft Post-Wash Corrosion Inspection (See Attachment 2), or locally developed guidance.

3.3.2.1. Verify that corrosion prevention and treatment procedures are accomplished according to technical order requirements.

3.3.3. Coordinates with the Maintenance Group Commander (MXG), Unit Corrosion Manager, and Quality Assurance to request depot assistance IAW T.O. 00-25-107, *Maintenance Assistance*, when corrosion treatments, structural repairs, LO coating and composite damage are beyond the unit's capability.

3.3.4. Ensure all personnel receive adequate training to accomplish assigned tasks, operate corrosion-prevention equipment, changes to inspection techniques, keep abreast of new qualified materials, and equipment and advances in composites and LO technologies.

3.3.5. Ensure no other maintenance is accomplished on aircraft or equipment during corrosion-prevention treatment/minor painting when hazardous/toxic materials are used, which require the use of personal protective equipment (PPE).

3.3.6. Ensure Bioenvironmental Services conduct initial baseline comprehensive evaluations, and provide annual follow-ups to determine adequacy of work center controls for occupational hazards.

3.3.7. Ensure ASM personnel, AFSC 2A7X3, receive occupational physicals as deemed necessary by local Medical Group Aero Medical Services IAW AFI 48-145.

3.3.8. Manage the corrosion-control facility/wash rack to include procurement of approved cleaning materials from the Qualified Products Lists (QPL), and other cleaning products listed in appropriate Technical Orders.

3.4. Aircraft Flight Chief/Element Supervisor Responsibilities:

3.4.1. Accomplish a cleanliness inspection of the aircraft after completion of wash, using the Aircraft Post-Wash Cleanliness Inspection (See Attachment 3), or locally developed guidance. The Dock Supervisor may accomplish the cleanliness inspection for phase/periodic aircraft washes.

3.4.2. Appoint an aircraft wash supervisor (Crew Chief/Assistant Crew Chief) for each wash. The wash supervisor uses the Aircraft Pre-Wash Supervisor's Guide (See Attachment 4), the Supervisor's Safety Briefing, (see Attachment 5), or locally developed guidance to brief personnel prior to starting a wash.

3.4.2.1. The wash supervisor ensures the wash facility is clean; equipment is properly maintained, and stored at the completion of each wash.

3.4.2.2. MQ-1/MQ-9 units will use the airframe cleaning procedures outlined in the applicable -51GS T.O.

3.4.3. Ensures that Aircraft Maintenance Squadron (AMXS) personnel are trained in the correct procedures for aircraft washing and cleaning using weapon-system technical data, job guides, and general information in T.O. 1-1-691, *Aircraft Weapon Systems Cleaning and Corrosion Control*.

3.4.4. Coordinates the use of wash rack/corrosion-control facilities, when necessary.

3.4.5. Procures and maintains personal protective equipment which is used during the wash process.

3.4.6. Performs washing and cleaning of assigned weapon system, using aircraft wash crews and approved cleaning materials authorized by T.Os and listed on Qualified Product Lists (QPL). Contract washes may be utilized to satisfy this requirement.

3.4.6.1. Units using wash contractors will be familiar with contract specifications, ensure the contractor is trained, uses approved materials (units may need to provide cleaning materials) and equipment, and follow applicable technical orders and inspection criteria. The unit will also provide a designated wash monitor who is responsible for the contract wash team at the time the work is accomplished to ensure safety and damage to the aircraft is avoided.

3.4.6.2. Identify contract discrepancies to Assigned QAR.

3.5. Quality Assurance Responsibilities:

3.5.1. Verify that approved materials and equipment are used to support the Corrosion Control Program. Ensure wash crews are properly trained and P&S schedules washes IAW the Aircraft Wash Interval listed in T.O. 1-1-691. Validate through follow-up inspections that corrective action is taken when discrepancies are noted.

3.5.1.1. Ensure aircraft washes are inspected as part of the RIL listed in **AFI 21-101** for cleanliness, corrosion, and lubrication after washing.

3.5.1.2. Units using a wash contractor will have a QAR assigned. QAR will be familiar with contract specifications, ensure contractor personnel are trained; and approved materials and equipment are used properly.

3.5.2. It is recommended that personnel who evaluate aircraft wash operations attend an AF approved Aircraft Corrosion Control training course.

3.6. Avionics Supervisor Responsibilities:

3.6.1. Ensures an effective Corrosion Control Program is established and enforced for avionics components and equipment.

3.6.2. Ensures that assigned personnel receive corrosion prevention and control training under the direction of the Unit Corrosion Manager and the Avionics Supervisor.

3.6.3. Ensures avionics work sections are familiar with, and have available for use, T.O. 1-1-689, *Avionics Cleaning and Corrosion Control*.

3.6.4. Ensures avionics maintenance personnel inspect for corrosion. When corrosion damage is beyond the capability of the shop; request assistance from the ASM work center.

3.6.5. Enforces the use of approved cleaning products authorized by Technical Data and QPLs.

3.7. Aerospace Ground Equipment (AGE) Supervisor Responsibilities:

3.7.1. Ensures an effective Corrosion Control Program is established and enforced for assigned equipment.

3.7.2. Ensures that AGE maintenance personnel receive corrosion prevention and control training under the direction of the Unit Corrosion Manager and AGE supervisor.

3.7.3. Ensures powered and non-powered AGE is cleaned, thoroughly inspected, and touched-up as necessary during each periodic inspection see T.O. 1-1-691, T.O. 35-1-3, *Corrosion Prevention and Control, Cleaning, Painting, and Markings of USAF Support Equipment (SE)*.

3.7.4. Enforces the use of approved cleaning products provided by Technical Data and Qualified Product Lists (QPLs).

3.7.4.1. Encourages the use of corrosion-preventative compounds (CPC).

3.7.5. Repainting will be determined by AGE supervision.

3.7.5.1. Surface preparation will be accomplished by owning work center.

3.7.5.2. Repainting will be accomplished by qualified AGE personnel, ASM/LOASM personnel, or qualified contractor. Units may also contact the ANG Regional Aircraft Paint facility, Sioux City who can scuff sand and repaint SE, on a limited basis, when slots are available.

3.8. Munitions Supervisor Responsibilities:

3.8.1. Ensures an effective Corrosion Control Program is established and enforced for assigned missiles, munitions, handling equipment, and trailers.

3.8.2. Ensures that munitions-maintenance personnel receive corrosion prevention and control training under the direction of the Unit Corrosion Manager and Munitions Supervisor.

3.8.3. Ensures that equipment is cleaned and corrosion treated during each periodic inspection, IAW T.O. 1-1-691, T.O. 35-1-3, and specific equipment technical data.

3.8.4. Enforces the use of cleaning products approved by Technical Data and the QPLs.

3.8.5. Repainting will be determined by the Munitions and ASM/LOASM.

3.8.5.1. Surface preparation will be accomplished by the owning work center.

3.8.5.2. Repainting will be accomplished by qualified munitions personnel, ASM/LOASM personnel, or a qualified contractor. Units may also contact the ANG Regional Aircraft Paint facility, Sioux City Iowa who can scuff sand and repaint SE, on a limited basis, when slots are available

3.8.6. Encourage the use of CPCs.

3.9. Communication and Ground Based Electronic Equipment Unit Commanders will:

3.9.1. Ensure the Maintenance Support (MS) Supervisor establishes a Corrosion Prevention and Control Program for ground mobile equipment, stressing prevention and control, through equipment cleanliness, timely detection, and maintenance of protective finishes.

3.9.2. Ensure adequate corrosion prevention and training program is in place for initial and recurring training.

3.9.3. Establish support as necessary with the host Aircraft Maintenance Squadron and Unit Corrosion Manager.

#### **4. Low Observable Aircraft Structural Maintenance (AFSC 2A7X5).**

4.1. Purpose of Low Observable Aircraft Structural Maintenance (AFSC 2A7X5). Responsible for performing aircraft LO system and structural repairs using advanced techniques and materials. Designs, repairs, modifies, and fabricates repair parts and components. Identifies and applies preservative treatments, corrosion preventatives, and LO materials. Inspects and ensures structural and LO integrity. Ensures personnel identify and treat corrosion on aerospace ground equipment. Supervises fabrication and repair of tubing assemblies using applicable technical data and engineering drawings. Uses electronic maintenance information systems to train personnel and track, manage, and monitor aircraft maintenance.

4.2. MAJCOM NGB/A4M and HQ ACC/A4V/A8F Responsibilities:

4.2.1. Manage the command's LO ASM maintenance career field.

4.2.2. Coordinate all intra-command LO ASM TDY manning assistance requests.

4.2.3. Represent MAJCOM at 2A7X5 utilization and training workshops.

4.2.4. Represent MAJCOM for all applicable 2A7X5 issues at LO conferences and meetings.

4.2.5. Forecast and ensure scheduling of 2A7X5 supplemental training.



- 4.2.6. Manage the CAF LO system.
- 4.2.7. Establish a LO subject matter expert position for each weapon system team with a LO platform assigned.
- 4.2.8. Develop and coordinate CAF policy and procedures for LO functions.
- 4.2.9. Represent CAF at all applicable LO meetings and conferences.
- 4.2.10. Provide the CAF with a list of dates available for the next fiscal year Signature Management Program flight test events no later than July of each year.
- 4.3. Wing Commander Responsibilities:
  - 4.3.1. Ensures funding is available to support annual RCS flight test requirements.
- 4.4. Maintenance Group Commander Responsibilities:
  - 4.4.1. Establish and maintain an effective low observables maintenance program.
  - 4.4.2. Appoint an experienced 2A7X5 technician or civilian equivalent to QA that is focused solely on low observable maintenance processes. Requirement is 1 per AMU.
  - 4.4.3. Ensure Plans, Scheduling & Documentation sections schedule F-22 and F-35 annual aircraft audits.
  - 4.4.4. Monitor annual low observable F-22 and F-35 audit trends to ensure fleet LO mission capable status is accurately documented and reported.
  - 4.4.5. Ensure LO trainees have an opportunity to obtain proficiency in all aspects of their career field.
  - 4.4.6. Support RADAR cross section (RCS) test events with required aircraft and maintenance personnel. This includes Signature Management Program flight testing, Acceptance Test Facility (turntable) revisits and Repair Verification Radar testing.
    - 4.4.6.1. Units must confirm aircraft will support SMP at least 90 days prior to event.
  - 4.4.7. Establish a policy to limit use of LO aero only panel restoration. Aero only is only used for confidence flights and must be minimized to avoid an uncontrollable backlog.
  - 4.4.8. Work closely with the OG/CC to balance flying requirements with maintenance capability to prevent an uncontrollable LO backlog.
  - 4.4.9. Ensure all F-22 maintenance personnel complete required LO management training.
- 4.5. Wing LO Survivability Superintendent Responsibilities (5<sup>th</sup> Generation Fighter Aircraft):
  - 4.5.1. Serve as the LO Subject Matter Expert (SME) responsible to the wing, NGB and ACC for 5th Generation Fighter Aircraft Signature Management Plan (SMP) and other RF diagnostic test events.
  - 4.5.2. Interface with the MAJCOM Low Observables (LO) Weapon System Manager (WSM) and Subject Matter Expert (SME) on all Signature Management Plan deployment scheduling requirements, to include dates, personnel, equipment, etc.

4.5.3. Interface with the NGB/A4M WSM, ACC/A8 LO SME and Responsible Test Organization on all SMP deployment scheduling requirements, to include dates, personnel, equipment, etc.

4.5.4. Plan and program TDY cost association with SMP flights.

4.5.5. Represent the wing at all applicable LO meetings and conferences.

4.5.6. Perform periodic reviews of aircraft Maintenance Information Systems and Signature Assessment Systems to assess the integrity of 5<sup>th</sup> Generation fighter low observables mission capable status reporting.

#### 4.6. Fabrication Flight Chief Responsibilities:

4.6.1. Use LO FTD training availability/capacity at every opportunity to elevate capability over the long term and provide recommended changes as required.

4.6.2. Forecast funding to attend and participate in applicable LO meetings, CPABs and other structural related programs/meetings.

4.6.3. Ensure accuracy of LO mission capable status documentation and reporting. This includes establishment of a SAS data integrity team to ensure data is routinely cross checked for accuracy.

4.6.4. Manage the maintenance data collection process, review data for correctness and take necessary action to rectify incorrect reporting.

4.6.5. Appoint an LO production supervisor to manage scheduling and workload on each shift.

4.6.6. Ensure fast/accelerated LO cure processes are used to the maximum extent possible to reduce flow time and increase aircraft availability.

4.6.7. Ensure all personnel exposed to LO work environments comply with OSHA, AF, MAJCOM and wing policies on hygiene standards and preventing contamination of common areas outside of the direct work environment.

4.6.8. Report fleet LO mission capable status (attachment 5) to the applicable MAJCOM weapon system team/WSM on a daily basis. Fleet SAS average reported must not include non-possessed aircraft.

#### 4.7. LO ASM Section Supervisor Responsibilities:

4.7.1. Maintain a comprehensive training plan that ensures assigned personnel develop and maintain proficiency in all facets of LO finishes, metallic structures, composite repair, corrosion control, signature assessment, and electronic maintenance information system data entry commensurate with awarded skill level.

4.7.2. Ensure LO ASM personnel receive pre-placement, special purpose, periodic and termination occupational physicals as deemed necessary by local Medical Group Aero medical Services IAW AFI 48-145.

4.7.3. Ensure LO ASM personnel provide updated information required to obtain and retain special program security access to the unit or group security manager in a timely manner.

4.7.4. Ensure an LO composite repair facility security training plan is developed with initial and annual training to be used for each individual working within the section.

4.7.5. Coordinate with maintenance supervision to group other maintenance actions with scheduled LO work (i.e. TCTOs, OTIs) on a non-intrusive basis to minimize aircraft downtime.

4.7.6. Work with AMUs to schedule aircraft downtime for LO REDUX at the appropriate time based on overall fleet health and/or SAS damage priority screen. LO REDUX time must be focused on reducing SAS margins. (See Attachments 9-12) Other scheduled/unscheduled LO FOM/TCTOs/maintenance must be planned separately. Optional LO margin maintenance (REDUX) is 3-5 days and must focus on multiple discrepancies, longer-lasting repairs, and greater SAS margin buyback. A long-line REDUX option (8-10 days) is preferred when aircraft availability permits.

4.7.7. Establish procedures for quick look LO inspections on all next day flyers to identify aircraft that will exceed 100% SAS margin and assess possible quick fix repair options.

4.7.8. Use expedient repairs for all damages that negatively affect aircraft mission capable status (e.g. fast cures, canopy film repair, etc.).

4.7.9. Maximize use of spray facilities by limiting to spray restoration only. Brush/roll application should be performed in other hangar locations.

4.7.10. Develop a dedicated LO OML inspection crew to maintain inspection consistency and inspector proficiency.

4.7.11. Establish an OML team rotation plan to ensure all LO personnel remain proficient.

4.7.12. Request depot assistance IAW T.O. 00-25-107 through the NGB/A4M WSM.

4.7.13. Ensure no other maintenance is accomplished on the aircraft, equipment, or within the environmentally controlled/cordoned-off areas during corrosion prevention/treatment or coatings restoration when hazardous/toxic materials are in use, which requires the use of specialized personal protective equipment.

4.7.14. Ensure deficiency reports (DR) are accomplished as necessary IAW T.O. 00-35D-54, *USAF Deficiency Reporting, Investigation, and Resolution*.

#### 4.8. LO Quality Assurance Responsibilities:

4.8.1. Establish a comprehensive inspection program that assures the integrity of LO maintenance and documentation associated with mission capable status reporting.

4.8.2. Identify/report all LO training and process deficiencies to the fabrication flight chief.

4.8.3. Include periodic participation in annual aircraft LO audit inspections as part of Maintenance Standardization Evaluation Program.

#### 4.9. Low Observable/Composite Repair Facility (LO/CRF) Manager Responsibilities:

4.9.1. Responsible for reporting facility operation deficiencies such as the Heating, Ventilation and Air Conditioning (HVAC) systems, compressed and breathing air systems, electrical systems, plumbing and drainage systems in the LO/CRF and on assigned real property of the LO/CRF.

4.9.2. Perform tasks related to the overall management and operations of the LO/CRF, including energy management and equipment inventory.

4.9.3. Perform facility inspections to determine repair and maintenance requirements. Ensure all measures are taken to maintain security accreditation of facility if required.

4.9.4. Submit facility work orders through Civil Engineer (CE) Customer Service. In cases of established/approved contract maintenance for facilities, contact contractor for emergency or out of cycle maintenance. This includes warranty repairs and maintenance required.

4.9.5. Prioritize and track the completion of work orders.

4.9.6. Maintain a record of all work performed by contractor and CE personnel to include response time and time required until satisfactory completion of work.

4.9.7. Perform facility and safety inspections as required by technical orders and Air Force instructions.

4.9.8. Maintain currency on Hangar Bay Door Operation and train employees and customers on hangar bay door operations.

4.9.9. Perform escort duties or provide escorts as needed for contract maintenance personnel within special access areas of the LO/CRF.

## **5. General Corrosion Prevention and Control.**

5.1. Corrosion Prevention and Control Programs are oriented toward the preventative maintenance concept in controlling corrosion through the maintenance of protective coatings (Conventional and Low Observable), equipment cleanliness, timely detection, and corrective treatment. Prevention is the key of an effective Corrosion Control Program; therefore, strict adherence to corrosion-prevention policies is essential.

5.2. All maintenance personnel, regardless of AFSC (Air Force Specialty Code), are responsible for detecting and documenting corrosion in the proper maintenance forms. Accurate documentation of maintenance actions in support of the Corrosion Control Program is essential to support future manning, equipment, training, and parts/material procurement requirements.

5.3. ASM/LOASM will evaluate corrosion discrepancies to determine proper treatment or repair.

5.4. Cross Flow of information is essential to the program and will enable maintenance personnel to communicate effectively with all echelons.

## **6. Washing Aircraft.**

6.1. A complete exterior wash and interior cleaning will be accomplished on all ANG aircraft as directed by T.O. 1-1-691 and Specific Weapons System TOs during scheduled

washes, prior to each phase/periodic inspection and after deployments. Exception: MQ-1/MQ-9 units will establish local procedures for frequency and cleaning requirements.

6.2. Documentation requirements are listed in the Technical Order series 00-20.

6.3. Proper lubrication is vital in preventing corrosion. Lubrication prevents water intrusion into bearing cavities and causing corrosion. When personnel wash components, between normal cleaning cycles (flightline washes), re-lubrication is required.

6.4. Units must strictly adhere to scheduled aircraft wash cycles. Units must report all overdue washes directly to NGB/A4MM and the owning SPD.

6.5. Units with aircraft operating near or over salt water must comply with clear water rinsing requirements, IAW T.O. 1-1-691. Deployed units must use every means possible to meet wash and rinse requirements at the Forward Operating Location (FOL). If unable to meet wash and rinse requirements, a waiver must be obtained using the guidelines outlined in T.O.1-1-691.

## **7. Corrosion Prevention and Control Training.**

7.1. All aircraft maintenance personnel will receive locally developed corrosion prevention and control training under the direction of the Unit Corrosion Manager.

7.2. Refresher training will be accomplished annually IAW IMDS and GO81.

7.2.1. Personnel in the ASM and LOASM work centers are exempt from routine corrosion prevention and control training.

7.2.2. Corrosion training does not replace normal on-the-job (OJT) requirements for individuals in any career field.

7.3. The Unit Corrosion Manager or designated representatives will conduct training. The Corrosion Manager, assisted by the Unit Maintenance Training Manager, updates training materials and information, and develops training curriculum. Training curriculum must include the following:

7.3.1. Establishing procedures and techniques for identifying corrosion.

7.3.2. Identifying unit specific weapon systems and equipment corrosion-prone areas.

7.3.3. Documenting procedures for identifying corrosion.

7.3.4. Selecting and using sealants, corrosion-preventive compounds (CPCs), and lubricants.

7.3.5. Selecting and using approved cleaning materials.

## **8. Maintenance Painting.**

8.1. Protective coating systems, Conventional and Low Observable, provide protection for aircraft and aerospace ground powered and non-powered equipment surfaces. Specific Weapon System and Equipment Technical Orders determine protective coating systems selection.

8.2. Maintenance painting is the application of coatings to aerospace equipment where the existing coating is deteriorated, damaged, or missing. Conventional and Low Observable maintenance painting must be kept to a minimum, and comply with federal, state, and local

environmental regulations. Maintenance painting of aircraft accomplished solely for cosmetics (beautification) is not authorized on ANG aircraft.

8.2.1. Aircraft stripping and repainting at field level is not authorized. When aircraft repainting is beyond the unit's capability; request assistance IAW T.O. 00-25-107, *Maintenance Assistance*. Fighter (Legacy) and HH-60 helicopter aircraft will be scheduled through the ANG Regional Paint Facility, 185 ARW, Sioux City, Iowa. This facility is annually funded by NGB/A4M and has the capability to provide a total scuff-sand and repaint following TO 1-1-8 and specific weapon system -23 requirements.

8.2.2. F-16 Aircraft: A scuff sand and overcoat of the aircrafts exterior should be performed at intervals such that the total mil thickness of the finish system does not exceed 18 Mils. A coating Grid sheet (See attachment 8) and a digital coating thickness gauge (LP) will be required to determine when a coating system needs to be de-painted. When the total coating thickness reaches 15-18 mils, contact NGB/A4M to schedule into the Depot Speed Line Program.

8.3. Units equipped with environmentally compliant aircraft painting facilities are authorized to perform mid-interval over coating of aircraft. LO aircraft may be re-painted, per technical data, at units with Restoration Bays. Work processes will be coordinated with local Environmental and Bioenvironmental offices.

8.4. A complete scuff and paint is allowable at MQ-1/MQ-9 units if a properly approved paint facility is available.

## **9. AIRCRAFT MARKINGS**

9.1. Aircraft exterior finishes and markings will be applied to aircraft in accordance with the following guidelines. (See Attachment 6, ANG Aircraft Markings, Attachment 7, Typical ANG Tail Marking Configuration and Attachment 8, F-16 Exterior Coating Grid).

## **10. Unit Nondestructive Inspection Program.**

10.1. Maintenance Group Commander Responsibilities:

10.1.1. Ensure that applicable programming documents (budget, facilities, manpower, maintenance, etc.) include the need for NDI support.

10.1.2. Ensure the environmental controls are managed IAW T.O. 33B-1-1, *Nondestructive Inspection Methods*

10.2. Nondestructive Inspection (NDI) Lab Supervisor Responsibilities:

10.2.1. Organizes, directs, and manages the NDI Program IAW T.O. 33B-1-1 and applicable publications.

10.2.2. When possible, attends DOD, Air Force Worldwide, and ANG Command NDI meetings and workshops.

10.2.3. Ensures only properly trained and certified personnel with AFSC 2A7X2 operate NDI equipment.

10.2.4. Ensures personnel performing NDI attend the AETC basic and seven level courses, or Air Force NDI Program Office approved civilian equivalent courses.

10.2.5. Ensures personnel receive adequate training (formal and OJT) to accomplish assigned tasking, and to acquire skills necessary for changes in inspection techniques and advances in equipment technology.

10.2.6. Ensures Bioenvironmental Services conduct initial baseline comprehensive evaluations, and provide annual follow-ups to determine adequacy of work-center controls for occupational hazards.

10.2.7. Ensures NDI personnel receive Occupational Health Physicals (OHPs) as deemed necessary by local Medical Group Aero medical Services IAW applicable publications.

10.2.8. Ensure that proper documentation is maintained to show qualification for those personnel performing F15/F16 Pratt & Whitney F100-PW-220/220E 4k Fan Drive Turbine 4<sup>th</sup> Stage Turbine Blade, Eddy Current Inspection.

HARRY M. WYATT III, Lieutenant General,  
USAF  
Director, Air National Guard

**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFPD 21-1 *Air Space Maintenance*, 25 February 2003

AFM 33-363 *Communications and Information*, 1 March 2008

AFI 21-101 *Air and Space Equipment Maintenance Management*, 26 July 2010

AFI 21-101 *Air and Space Equipment Maintenance Management*, ANG Sup, 22 April 2011

AFI 20-114 *Air & Space Equipment Structural Management*, 7 June 2011

AFI 21-124, *Air Force Oil Analysis Program* 8 December 2010

AFI 63-101, *Acquisition and Sustainment Life Cycle Management*, 17 April 2009

AFI 48-145, *Aerospace Medical Operations*, 15 Sept 2011

AFI 63-1001, *Aircraft Structural Integrity Program* 18 April 2002

T.O. 00-25-107, *Maintenance Assistance* 15 Aug 2011

T.O. 1-1-8, *Application and Removal of Organic Coatings, Air and Space and Non-Air and Space Equipment*, 12 January 2012

T.O. 1-1-689, *Avionics Cleaning and Corrosion Prevention/Controls*, 5 July 2009

T.O. 1-1-691, *Aircraft Weapons Systems Cleaning and Corrosion Control*, 12 April 2010

T.O. 33B-1-1, *Nondestructive Inspection Methods, Basic Theory*, 1 Oct 2009

T.O. 35-1-3, *Corrosion Prevention and Control, Painting and Marking of USAF Support Equipment*, 6 August 2009

***Abbreviations and Acronyms***

**AETC**—Air Education and Training Command

**AFPCPO**—Air Force Corrosion Prevention and Control Office

**AFOSH**—Air Force Occupational Safety and Health

**AFSC**—Air Force Specialty Code

**AFM**—Air Force Manual

**AFSC**—Air Force Specialty Code

**AGE**—Aerospace Ground Equipment

**AMXS**—Aircraft Maintenance Squadron

**ANGRC**—Air National Guard Readiness Center

**ASM**—Aircraft Structural Maintenance

**C-E**—Communications Electronics



**CPAB**—Corrosion Prevention Advisory Board  
**CPC**—Corrosion Preventive Compound  
**CTIO**—Coating Technology Integration Office  
**CTSC**—Coating Technology Screening Committee  
**DOD**—Department of Defense  
**FTD**—Field Training Detachment  
**GMAJCOM**—Gaining Major Command  
**LO**—Low Observable  
**LO/ASM**—Low Observable Aircraft Structural Maintenance  
**MAJCOM**—Major Command  
**MXG**—Maintenance Group Commander  
**MS**—Maintenance Support  
**MSDS**—Material Safety Data Sheet  
**NESHAP**—National Emission Standards for Hazardous Air Pollutants  
**NGB**—National Guard Bureau  
**NDI**—Non-Destructive Inspection  
**OJT**—On the Job Training  
**OHP**—Operation Health Physical  
**OSHA**—Occupational Safety and Health Association  
**PPE**—Personal Protective Equipment  
**QPL**—Qualified Products List  
**SE**—Support Equipment  
**SME**—Subject Matter Expert  
**SPOC**—Single Point of Contact

## Attachment 2

**AIRCRAFT POST WASH CORROSION INSPECTION**

**A2.1. Purpose:** To provide general, minimum, requirements for performing aircraft post-wash corrosion inspections. Units may add requirements as necessary to enhance corrosion inspection procedures. Copying of this attachment is authorized.

**A2.2. ASM and LOASM work center responsibilities:**

A2.2.1. Upon completion of this inspection, corrosion discrepancies found are entered in the applicable records.

A2.2.2. Clear post-wash corrosion inspection from aircraft AFTO 781A.

**A2.3. Instructions:** Inspect aircraft for the following conditions: corrosion, residual water, soap residue, paint- condition, sealant-condition using Table A2.

A2.3.1. Column 1: Minimum corrosion prone areas to be inspected.

A2.3.2. Column 2: Verify inspection complied with by placing a checkmark in this column.

A2.3.3. Column 3: Place a checkmark if area does not apply to weapon system.

A2.3.4. Column 4: Enter findings in this column.

**Table A2.1. Aircraft Post-Wash Corrosion Inspection.**

<b>Tail Number:</b>			<b>Date:</b>
<b>Minimum Corrosion Prone Area To Be Inspected</b>	<b>Inspection Complied With</b>	<b>Area Does Not Apply To Weapons System</b>	<b>Findings/Remarks</b>
<b><i>Landing Gear</i></b>			
NLG wheels			
NLG assembly			
NLG wheel well			
MLG wheels			
MLG assembly			
MLG wheel wells			
<b><i>Fuselage External</i></b>			
Bottom Of Fuselage			
Tip of radome to NLG			
NLG to MLG			
MLG to tail			

<b><i>Sides and Top</i></b>			
Nose to wing root area			
Fwd wing root to aft wing root			
Aft wing root to tail			
<b><i>Empennage External</i></b>			
Vertical stabilizer			
Horizontal stabilizer			
Tail Pylon (Helicopters)			
<b><i>Engines</i></b>			
Nacelle areas			
Cowling			
Intake			
Exhaust Path			
<b>Minimum Corrosion Prone Area To Be Inspected</b>	<b>Inspection Complied With</b>	<b>Area Does Not Apply To Weapons System</b>	<b>Findings/Remarks</b>
Propeller/rotor blades			
Pylons			
<b><i>Wings</i></b>			
Top of left wing			
Bottom of left wing			
Left wing flapwell			
Top of right wing			
Bottom of right wing			
Right wing flap well			
<b><i>Aircraft Interior</i></b>			
Cargo compartment floor			
Lt chine cover			
Rt chine cover			
Battery compartment			
Galley			

Flight Deck/cockpit			
Latrine/urinal area			

## Attachment 3

## AIRCRAFT POST-WASH CLEANLINESS INSPECTION

**A3.1. Purpose:** To provide general, minimum, requirements for performing aircraft post-wash cleanliness inspections. Units may add requirements as necessary to enhance cleanliness inspection procedures. Copying of this table is authorized. Completed inspections sheets will be kept on file for at least one calendar year.

**A3.2. Definitions:** Clean. All references to the condition of clean pertain to the following description: To determine if surfaces are clean, a close visual inspection is accomplished to ensure all residues, oily film, and streaking has been removed.

**A3.3. General:** The aircraft post-wash cleanliness inspection is accomplished by the Flight Chief/Element or Isochronal Inspection (ISO) Dock Supervisor.

**A3.4. Documentation:** The following entries are recommended:

A3.4.1. Aircraft taped and prepped for wash. This entry is entered in the forms on a red X prior to the wash. It is cleared after the cleanliness inspection is successfully completed.

A3.4.2. Aircraft due cleanliness inspection. This entry is placed on a red dash, and cleared by the Flight Chief /Element Supervisor.

A3.4.3. Aircraft due corrosion inspection. This entry is placed on a red dash, and cleared by the ASM work center.

A3.4.4. Aircraft due lube after wash. This entry is entered in the forms on a red X.

**Table A3.1. Aircraft Post-Wash Cleanliness Inspection.**

<b>Tail Number:</b>		<b>Date:</b>	
<b>Landing Gear (grease, dirt, oil, brake dust, tire deposits, &amp; soap residue)</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
NLG wheels			
NLG assembly			
NLG wheel well			
MLG wheels			
MLG assembly			
MLG wheel wells			
<b>Fuselage External (dirt, oil, grease, trapped fluids &amp; soap residue)</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
Bottom of fuselage			
Tip of radome to NLG			
NLG to MLG			

MLG to tail			
<b>Sides and Top</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
Nose to wing root area			
Fwd wing root to aft wing root			
Aft wing root to tail			
<b>Empennage External</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
Vertical stabilizer			
Horizontal stabilizer			
Tail Pylon (Helicopters)			
<b>Nacelle (dirt, debris, oil, grease, soap residue &amp; exhaust path residue)</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
Nacelle areas			
Cowling			
Intake			
Exhaust Path			
<b>Nacelle (Continued) (dirt, debris, oil, grease, soap residue &amp; exhaust path residue)</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
Propeller / Rotor Blades			
Pylons			
<b>Aircraft Interior (dirt, debris, stains, spilled or trapped fluids)</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
Cargo compartment floor			
Lt chine cove			
Rt chine cove			
Battery compartment			
Galley			
Flight Deck / Cockpit			
<b>Latrine/Urinal (urine, residue, dirt, debris, stains, spilled or trapped fluids)</b>			
	<b>CLEAN</b>	<b>DIRTY</b>	<b>REMARKS</b>
Latrine/Urinal/Surroundings			

Wings (dirt, oil, grease, trapped fluids, and soap residue)			
	CLEAN	DIRTY	REMARKS
Top of left wing			
Bottom of left wing			
Left wing flap well			
Top of right wing			
Bottom of right wing			
Right wing flap well			

**Attachment 4****AIRCRAFT PRE-WASH SUPERVISOR'S GUIDE**

- A4.1.** Are all eyewash and showers inspected and in operating condition? Is the wash facility clean?
- A4.2.** Is the air pressure source regulated to equipment specifications?
- A4.3.** Is all Personal Protective Equipment (PPE) in serviceable condition?
- A4.4.** Is there enough PPE for all personnel?
- A4.5.** Is the aircraft properly configured for wash?
- A4.6.** Is an approved soap used IAW T.O. 1-1-691 and the QPL?
- A4.7.** Are all stands and washing equipment inspected and in serviceable condition?
- A4.8.** Are all applicable Material Safety Data Sheets (MSDS's) available at the work location?
- A4.9.** Is the mixture of soap and water IAW T.O. 1-1-691 or the manufacturer's instructions?



**Attachment 5****SUPERVISOR'S SAFETY BRIEFING**

**A5.1.** Explain the use of PPE.

**A5.2.** Explain the proper use of all safety equipment and show all personnel the location of eyewash stations, shower, and emergency exits.

**A5.3.** Brief all personnel, including Wash Contractors, on workplace hazards:

A5.3.1. Wet floors

A5.3.2. Hoses on floor

A5.3.3. Pushing stands on wet floors

A5.3.4. Aircraft protrusions hazards

A5.3.5. Water and soap dripping from aircraft

A5.3.6. Standing on aircraft without proper safety gear

A5.3.7. Working in wheel well's, dangers of bumping head and sharp objects

A5.3.8. Air pressure adjustments

A5.3.9. Using maintenance stands that are wet

**A5.4.** Brief all personnel on MSDS's that are applicable:

A5.4.1. Brief specific hazards of chemicals

A5.4.2. Brief emergency and first aid procedures for the specific chemicals

A5.4.3. Brief location of MSDSs

## Attachment 6

### ANG AIRCRAFT MARKINGS

#### A6.1. Aircraft Marking Guidance:

A6.1.1. This attachment implements the policies outlined in AFI 20-114, *Air and Space Equipment Structural Management*, and provides guidance for applying command approved, non-USAF standard, aircraft marking, as authorized in T.O. 1-1-8.

A6.1.2. Paint schemes/configurations and USAF standard aircraft markings will be applied in accordance with T. O. 1-1-8, Specific Weapons System –23, or SPD approved aircraft drawings.

A6.1.3. Aircraft inputs to depot will be marked IAW Air Force directives, unless otherwise approved by NGB/A4M.

A6.1.4. NGB/A4MM is the point of contact (POC) for ANG aircraft painting and markings. For ACC-gained aircraft, HQ ACC/A4MS is the POC for 2-digit unit-designation markings, when used.

#### A6.2. Appearance Standards:

A6.2.1. All aircraft markings and basic paint schemes will be maintained intact, legible, and distinct in color. Standardization of markings (by MDS) is of primary concern.

A6.2.2. Legacy fighter units are recommended to overcoat their aircraft at the mid-point of their scheduled PDM/Speed line cycle to maintain coating system integrity and aircraft appearance. Units will accomplish maintenance painting (touch-up) at home station, when possible, and use the ANG Regional Paint Facility, Sioux City, Iowa, when mid-cycle overcoating is required.

A6.2.2.1. F22 Units/Associates may accomplish coating restoration per specific TO Instructions where restoration facilities are available. Full de-paint and re-paints will be done by Depot/Contractor personnel.

A6.2.3. Large aircraft units should rely on maintenance painting between depot cycles to maintain coating integrity. Overcoats will be scheduled through the depot/contractor by NGB/A4MA on a case-by-case basis.

A6.2.4. Fully over coated aircraft will be documented in IDMS/GO81 and the individual aircraft AFTO Form 95 for tracking purposes. Weight and balance after a complete overcoat may be required. Check specific weapon T.O. guidance.

A6.2.5. Maintenance Painting Guideline: Minor: 2-sq ft or less, Major: 2-sq ft or larger. Minor includes, but not limited to, nicks, scratches, panel edges, rusty fasteners, or when new fasteners are installed during panel up. Major: includes, but not limited to, leading edges, large repairs, removable panels, wheels, or new parts.

#### A6.3. Marking Options: The following options from T.O. 1-1-8 are delegated to the Wing Commander:

A6.3.1. May authorize a distinguishing colored horizontal stripe for application on both sides of the middle or top-most portion of the vertical fin and rudder, if applicable. Flat

colors or contrasting grays can be used but must match gloss requirements of the basic paint scheme.

A6.3.2. The state/city name within the tail stripe may be used. Nicknames in the tail stripe are not authorized. Exception: 130 AW Charleston WV is authorized to use "Charlie West" to reduce confusion within military circles with Charleston SC or Charleston AFB.

A6.3.3. Tail art may be used, such as Bird of Prey type marking. Size and location TBD by the unit, but must not interfere with mandatory marking or existing camouflage patterns. Only flat colors are allowed and must match gloss requirements of the basic paint scheme can be applied. **Note:** Changing the color(s)/pattern(s) on vertical tail(s) is not authorized without SPD approval.

A6.3.4. May authorize special aircraft markings that reflect mission activity, crew accomplishment, and unit esprit de corps, within the following guidelines:

A6.3.5. Markings can be applied on nose, tails, engine nacelles, gear doors, drop tanks, and travel pods. Markings must be applied in flat colors or contrasting grays that match gloss requirements of the basic paint scheme.

A6.3.6. Names of pilots, crew chiefs, or other members of the flight/ground crew maybe applied, IAW T.O. 1-1-8. Applications of nicknames and/or call signs are not authorized. Units must remove all air crew & crew chief names and ensure that area(s) where these names are placed are not legible when the stencil or vinyl lettering is removed. These areas may need re-painted prior to deploying into hostile environments.

A6.3.7. May authorize location of placards indicating armament loads on camouflaged aircraft, if not otherwise specified.

**A6.4. Nonstandard Markings:** *All nonstandard markings must be approved by NGB/A4MM.* Semi-gloss or high gloss colors are not authorized on any camouflage or flat gray aircraft. Units will forward a clear/detailed color photograph of their aircraft that depict nonstandard markings. A letter of approval from the Wing Commander must accompany all photos. Photos (digital) will be provided to NGB/A4MM for approval. If markings are changed in the future, new photos and approval letter from the Wing Commander must be forwarded within 30 days of the change. Original letters of approval must be kept on file at the unit for inspection purposes. Digital photos can be sent by email (call DSN 612-8715 for email address) or provided on CD by mail to: NGB/A4MM, Attention: Maintenance Functional Manager, 3501 Fetchet Avenue, Andrews AFB MD 20762-5157.

A6.4.1. Nose Art: For the purpose of clarification, "Nose Art" will be the term used to identify specialized artwork applied to specific areas of the aircraft. Nose art is authorized for all ANG owned aircraft. LO aircraft will use coating materials approved for that specific aircraft. No vinyl or decals will be allowed on the outer mod line of an LO aircraft. Wing Commanders must approve all nose art, in writing, and be responsible for issues associated with its application. Nose art will not exceed 18 inches for fighter aircraft, 36 inches for large aircraft, not infringe on mandatory aircraft markings and meet the gloss requirements of the original paint scheme. Units that are called upon to perform in a hostile environment may be required to remove nose art prior to deployment or at the FOL. Nose art must:

A6.4.1.1. Be distinctive, symbolic, and designed in good taste.

A6.4.1.2. Enhance unit pride.

A6.4.1.3. Be gender neutral.

A6.4.1.4. Match gloss requirements of the basic paint scheme.

A6.4.1.5. Units will be responsible for all copyright issues.

A6.4.2. Aircraft Names: Naming of aircraft (i.e. City of ....., Spirit of....., etc.) will be accomplished IAW TO 1-1-8 and AFI 21-101.

A6.4.3. Competition Aircraft: Units participating in competitions such as William Tell, Gun Smoke, Tiger Meet, Red Flag, etc., will follow the guidelines established in the competition rules for aircraft appearance. Competitions should be considered “come as you are”. “Come as you are” is defined as no special effort, painting, or additional markings applied to enhance or improve the overall appearance of the aircraft.

A6.4.4. Wing Aircraft: Wing commanders will select aircraft to be specifically marked highlighting the 2-digit unit designator and radio call numbers is authorized using flat white, black or contrasting grays. Tail and nose art can be applied using flat colors that match the gloss requirements of the original paint scheme.

A6.4.5. Special Mission Aircraft: The ANG has a number of “Special Mission Aircraft” assigned. Several of these units maintain aircraft with high gloss paint systems and markings. These aircraft will be marked IAW T.O. 1-1-8 or specific manufacture/SPD drawings. Additional tail markings; i.e., color stripes, Minuteman logo, State Name, etc., are considered optional, must be approved by the Wing Commander, in writing, and kept on file within the unit. Waxing of high gloss aircraft is not authorized IAW 1-1-691.

A6.4.6. Anniversary Markings: Wings are authorized to apply anniversary marking to their aircraft. Markings may be applied on the vertical tail or forward fuselage only. Anniversary markings must be removed after one year. No extensions or waivers will be accepted. Aircraft so marked will not be utilized in FOL or for combat mission accomplishment. These marking are to enhance unit pride/heritage and to improve public relations.

**A6.5.** Static Display Aircraft: Static display aircraft located at ANG units and CRTC Training sites must be maintained IAW AFI 84-103. Wing Commanders will ensure funding is provided annually for up-keep, maintenance, washing and paint touch-up. Appoint an Airpark Manager, in writing, to oversee static display activities. This individual will ensure maintenance records are properly maintained, kept on file with the unit historian, and the Historical Property Agreement with the USAF Museum is updated annually.

A6.5.1. Repainting of static display aircraft should be accomplished every 5-7 years. Use of Low VOC Mil Spec or Industrial primers and high UV gloss coating is recommended. Work can be accomplished by unit personnel or contracted out. State and local environmental regulations must be met and will vary from state to state.

**A6.6.** Aircraft Transfers: Units transferring aircraft to another unit or Command must remove the following marking. Exceptions: Aircraft going into AMARC for storage, FMS or disposal.

A6.6.1. Organizational insignias

A6.6.2. Unit designator

A6.6.3. Tail stripe

A6.6.4. Aircrew and crew chief names

A6.6.5. Unit unique markings

A6.6.6. Nose art may be retained if gaining unit agrees.

### A6.7. Marking Specifications.

**Table A6.1. Marking Specifications.**

<u>Aircraft</u>	<u>Paragraph</u>
A/O-10	A6.7.1.
E-8(B-707-400)	A6.7.2.
HC/MC/MP-130	A6.7.3.
C-130 E-J	A6.7.4.
F-15	A6.7.5.
F-16	A6.7.6.
HH-60	A6.7.7.
C-5	A6.7.8.
C-17	A6.7.9.
KC-135	A6.7.10.
C-21	A6.7.11.
C-27	A6.7.12.
MQ-1	A6.7.13.
MQ-9	A6.7.14.
B2 & F-22	A6.7.15.

### NOTES:

1. The word “**Optional**” means a local Wing Commander option. Local markings will not be placed on the aircraft during PDM or contractor scuff sand and repaints. Units must apply at home station.
2. The use of computer stencil makers, and vinyl material at local units and Depot/Contractors is authorized IAW T.O.1-1-8. Variations in size, width, length, and spacing of letters/numbers may be different due to the various computer programs available.
3. Associate Wings may apply their Command or Squadron emblems on ANG owned aircraft. ANG emblems will always be first. Location and size of these markings will be determined by the owning unit.

## A6.7.1. OA/A-10.

**Table A6.2. OA/A-10.**

COMMAND MINUTEMAN INSIGNIA: 18 inches (flat black) **Optional**. TBD by Wing Commander, (tail or fuselage)

ORGANIZATIONAL INSIGNIA: 18 inches (flat decal or colors) **Optional**. Left Side: above panel F-18 and aft of panel F-44. Right side: above panel F-79 and aft of panel F-105. UNIT DESIGNATOR: 12 inches (flat black or contrasting gray) **Optional**. Vertical: Lower edge 3 inches above tail numbers. Horizontal: Centered on vertical stabilizer.

PILOT AND CREW CHIEF NAMES: (flat black) **Optional**. Pilot on left side under windscreen, beginning at FS 118.92. Crew chief under pilot's name. Assistant crew chief under crew chief name.

AIR FORCE OUTSTANDING AWARD: 3 inches by 12 inches (flat decal, contrasting grays or flat black) **Optional**. NOSE NUMBER: 6 inches (flat black). Last three/four digits of tail number on both sides of aircraft nose.

RADIO CALL NUMBERS: 6 Inches (flat black). Location: IAW T.O. 1A10A-23- Detail 75.

TAIL FLASH: If tail flash extends onto rudder area, rudder must be weighed and balanced I.A.W. T.O. 1A-10A-3-1.

## A6.7.2. E-8 (B-707-400).

**Table A6.3. E-8 (B-707-400).**

AMERICAN FLAG: 31.5 inches by 60 inches. Applied on both sides of the vertical stabilizer. The top of the flag is located at Fin Station 210.15 with the forward top corner of each flag on the vertical leading edge seam.

COMMAND & ORGANIZATIONAL INSIGNIA: 18 inches (gloss, multi-color), **Optional** Insignias will be placed on the left side of the aircraft, aft of the fwd crew door in the following order: ANG shield, 116 ACW shield, and ACC shield.

UNIT DESIGNATOR: 36 inches (gloss black) **Optional**. The GA will be placed on both sides of the vertical tail, 24 inches below the American flag. Left designator begins 20 inches in from the leading edge. Right designator ends 20 inches in from the leading edge

RADIO CALL NUMBERS: 12 inches high (gloss black). Bottom of number, 33 inches above WL 303.30, top corner of the first number (left hand side) or last number (right hand side) at the leading edge seam.

PILOT & CREW CHIEF NAMES: 3 inches in height maximum (gloss black) **Optional**. Pilot and co-pilot will be placed on the left side of the aircraft nose under the windows: Crew Chief and Asst Crew Chief will be placed on the right side of the aircraft nose under the windows. MCC and AOT crew names will be posted on the inside of the aircraft. Location TBD by unit.

NOSE NUMBERS: 6 inches (gloss black). **Optional**. Last four digits of tail number, on left and right nose gears doors, 2 inches from bottom of the door and centered between fwd and aft

edges. (Tops of charters up with door open)

**AIR FORCE OUTSTANDING AWARD:** 3 by 12 inches (gloss, multi-color decal), **Optional**.

Located on the left side of the aircraft, 4 inches above and centered on the 116 ACW shield.

**TAIL STRIPE:** 15 inches in width. (Gloss-multi-color), **Optional**. The background is black, (color #17038), 11 inches wide, with two red (color # 11136), 2 inch stripes located on the top and bottom of the black background. The *GEORGIA* will be in Gold Metallic finish (color #17043) and the letters are BOOKMAN BOLD ACCT. A.K. Rev C, with a 15-degree slant (facing aft for both left and right side), 9 inches high with a one inch gap between top and bottom red stripes.

**LOCATION:** 20 inches below the top of the vertical stabilizer and in a leveled position.

### A6.7.3. HC/MC/MP-130.

A6.7.3.1. HC Aircraft assigned to the 106, 129 and 176 RQW are now ACC gained, but painted in the AFSOC paint scheme, using AFSOC Drawing #93104893.

A6.7.3.2. Paint and markings will be two tone; #36118/dark gray and #36293/light gray.

A6.7.3.3. The US Flag are not authorized on MC and MP aircraft. ACC must approve their application on HC aircraft.

A6.7.3.4. All other marking will be Wing Commander Options. Maintenance and Operations need to communicate before these options are accomplished to ensure mission integrity is not compromised.

### Table A6.4. HC/MC/MP-130.

**ANG TAIL MARKING:** 6 inches (Flat Black) **Optional** Centered on both sides of vertical stabilizer above the tail number.

**COMMAND MINUTEMAN INSIGNIA:** 30 inches, (contrasting gray) **Optional**. Location TBD (tail or fuselage).

**ORGANIZATIONAL INSIGNIA:** 30 inches (contrasting gray) **Optional**. Insignia will be placed on the fuselage, the bottom of the insignia will center on WL 190.0. The insignia will be centered on FS 270.0.

**PILOT/CREWCHIEF/ASSISTANT Names:** (contrasting gray) **Optional**. Size and location determined by the unit. Placing names inside the aircraft will avoid removal and replacement prior to and after deployments.

**AIR FORCE OUTSTANDING AWARD:** 3 inches by 12 inches (flat decal, contrasting gray). Centered, 3 inches above crew entry door **Optional**.

**STATE NAME:** 10 inch (contrasting gray) **Optional**. Centered on FS 551.00, 10 inches from main landing gear door hinge point.

ENGINE INLET SCOOPS and TI APU Panels: **Optional.** These areas may be stripped if paint erosion or heat damage is occurring. Submit TAR to C-130 Engineering for disposition.

BLACK EXHAUST TRACKS: **Optional.** Black exhaust tracks may be added to the bottom of the wing and flap areas only. This was approved by C-130 Engineering and AFSOC HQ, as a field level option only. Black exhaust track will not exceed 96" wide.

#### A6.7.4. C/EC-130 E-J.

A6.7.4.1. Equipment Excellence aircraft assigned to the 176 AW are authorized to use tail marking configuration **AK** in flat black or contrasting gray. (See Attachment 7)

A6.7.4.2. Equipment Excellence EC-130J aircraft assigned to the 193 SOW will be painted IAW AF Drawings # 200917976 and # 200917977).

A6.7.4.3. Equipment Excellence C-130J aircraft will be painted IAW Drawings # 201122423 and # 201122424 or contact C-130 SPO if additional info is required.

A6.7.4.4. High Gloss LC-130 aircraft assigned to the 109<sup>th</sup> AW will be painted IAW AF Drawing 9144927. Wheeled aircraft will be painted Equipment Excellence, IAW AF Drawings 9144700, 9276080, 9276081, 9276082.

#### Table A6.5. C/EC-130 E-J.

UNITED STATES FLAG: 24 inches X 48 inches (Matte finish). Both sides vertical stabilizer, bottom of flag located 154 inches above horizontal stabilizer with bottom of flag centered horizontally on vertical stabilizer. (Except EC)

ANG, TAIL MARKING: 12 inches (flat black). Both sides of vertical stabilizer, top of letters located 10 inches below and centered under flag. (Except EC)

VERTICAL STAB TIP STRIPE: Top 30 inches of vertical stabilizer to run horizontally not to exceed 15 inches. Solid color with no other marking allowed. **Optional** (Except EC)

TAIL BAND STRIPES: (flat black) 2-inch upper strip located 10 inches below bottom of ANG; 2 inches lower stripe located 12 inches below bottom of upper stripe. Top horizontal stripe will wrap around leading edge and run to the trailing edge of rudder, not to extend onto the rudder trim tabs; bottom stripe will wrap around the leading edge and run to the trailing edge of the rudder. (See Attachment 7) (Except EC)

RADIO CALL NUMBERS: 12 inches (flat black). Both sides of vertical stabilizer, top of numbers located 10 inches below bottom of lower tail band stripe, centered under flag. (See Attachment 7) (Except EC)

NOSE CALL NUMBERS: 4 digit, 6 inches (flat black) **Optional.** Location starting at FS 139 (measurement is for H/J model aircraft, and may vary on older E aircraft) and runs aft. The bottom of numbers is horizontal with the bottom of the lower pilot window WL 200.00 to 198.00.

UNIT CALL NUMBERS/LETTERS: 6 inches (flat black) **Optional.** Top of number/letter is located 6 inches from the bottom of the nose call number, starting at FS 139.



AIR FORCE OUTSTANDING AWARD: 3 inches by 12 inches (flat decal, contrasting grays or flat black), centered 3 inches above crew entry door. **Optional**

PILOT/CREW CHIEF/ASSISTANT NAMES: (flat black) **Optional**. Size and location determined by the unit. (Except EC). Placing names inside the aircraft will avoid removal and replacement prior to or after deployments.

COMMAND MINUTEMAN INSIGNIA: 30 inches, (flat black or gray decal) **Optional**. Both side of vertical stabilizer centered with the flag. The top of the emblem is 10 inches from the bottom of the call number.

STATE NAME: 10 inch (flat black), centered on FS 551.00 and 10 inches from main landing gear door hinge point. (Attachment 7)

BLACK EXHAUST TRACKS: **Optional**. C-130 engineering has approved, at field level, the widening of exhaust tracks from 60 inches to 96 inches, on the bottom of the wing and flap area. Application is also extended to the top of the flaps, if desired. SPD approval is on file at NGB/A4MM. **NOTE:** IAW 1C130A-23CL, use of CBA6 Soil Barrier in the exhaust area is a **Command Option**. Units **are no longer** mandated to use this material.

#### A6.7.5. F-15.

**Table A6.6. F-15.**

COMMAND MINUTEMAN INSIGNIA: 18 inches (flat black) **Optional**. Location TBD (tails or fuselage).

ORGANIZATIONAL INSIGNIA: 18 inches (flat decal or flat colors) **Optional**. Vertical: Bottom of insignia on WL 100.0. Horizontal: Forward edge of insignia on FS 458.0.

UNIT DESIGNATOR: 24 inches (flat black) **Optional**. Vertical: Top of letters even with top of rudder. Horizontal: Leading edge of first letter on FS 760.0.

PILOT and CREW CHIEFS NAMES: Size TBD by unit. **Optional**. Pilot name centered below left windscreen frame and crew chief and assistant crew chief names centered below right wind screen frame.

AIR FORCE OUTSTANDING AWARD: 3 inches by 12 inches (flat decal, contrasting grays or flat black). Location TBD by each unit. **Optional**.

NOSE NUMBER: 4 inches (flat black). **Optional**. Last three or four digits of tail number vertically on left and right side of nose gear door.

RADIO CALL NUMBER: 15 inches (flat black), location IAW 1F-15A-23, Fig 10-1.

#### A6.7.6. F-16.

**Table A6.7. F-16.**

COMMAND MINUTEMAN INSIGNIA: 18 inches (flat black). **Optional**. Location TBD by Wing Commander, (tail or fuselage).

ORGANIZATIONAL INSIGNIA: 10 inches (subdued decal or flat colors). **Optional**. Vertical:

Top of insignia 11 inches below fuselage/intake splitter vane. Horizontal: Leading edge 52 inches aft of intake duct lip.

UNIT DESIGNATOR: 18 inches (flat black). **Optional.** Vertical: Bottom of numbers at WL 158.0. Horizontal: Leading edge of first letter on FS 482.07.

AIR FORCE OUTSTANDING AWARD: 3 inches by 12 inches (flat decal, contrasting grays or flat black), Location TBD by each unit. **Optional.**

PILOT and CREW CHIEFS NAMES: Size TBD by unit. **Optional.** Pilot name on left canopy rail, and crew chief and assistant crew chief names on right canopy rail.

NOSE NUMBER: 4 inches (flat black); last three or four digits of tail number on both sides of nose gear door. **Optional**

RADIO CALL NUMBER: 12 inches (contrasting gray) **NOTE:** Field units may change call numbers to flat black at home station. Aircraft returning from depot will be painted in contrasting gray IAW 1F-16C-2-00GV-00-1.

#### A6.7.7. **HH-60.**

A6.7.7.1. Aircraft assigned to the 106, 129 and 176 are now ACC gained and will be painted with Mil-PRF-85285 Extended Life Coating, Color # 36118 and marked in Flat Black color # 37078

#### **Table A6.8. HH-60.**

COMMAND MINUTEMAN INSIGNIA: 10 inches (flat black). **Optional.** Location TBD by Wing Commander.

ORGANIZATIONAL INSIGNIA: 10 inches (subdued decal or flat colors). **Optional.** Wing: on right cargo door 8 inches below forward window, centered. Squadron: on left cargo door, 8 inches below forward window, centered.

PILOT/AIRCREW/CREW CHIEF NAMES: 3 inches maximum (flat black). **Optional.** Pilot: Right door, 2.5 inches below window, centered. Copilot: Left door, 2.5 inches below window, centered. Crew chief/assistant: Crew chief, right cargo door, 3.1 inches below and centered on forward window. Assistant: Left cargo door, 3.1 inches below and centered on forward window. Placing names inside the aircraft will avoid removal and replacement prior to or after deployments.

AIR FORCE OUTSTANDING AWARD: 3 inches by 12 inches (flat decal, contrasting gray or flat black), Location TBD by each unit. **Optional.**

#### A6.7.8. **C-5.**

#### **Table A6.9. C-5.**

UNITED STATES FLAG: 24 inches by 48 inches (Matte). Both sides of vertical stabilizer, bottom of flag on WL 626, Top of flag, horizontally centered between the 10 percent chord front beam and the 64 percent rear chord beam.

ANG, TAIL MARKING: 18 inches (flat black). Both sides of vertical stabilizer, top of letters

located 12 inches below bottom of flag. Top letters will be horizontally centered between 10 percent chord front beam and the 64 percent rear chord beam.

**TAIL BAND STRIPES:** (flat black) 2 inch upper strip located 12 inches below bottom of “ANG”; 2 inches lower stripe located 12 inches below bottom of upper stripe. Top horizontal stripe located 18 inches down from bottom of upper stripe. Stripe will run horizontally from aft edge of the leading edge seam, back to trailing edge of the rudder.

**RADIO CALL NUMBERS:** 18 inches (flat black). Both sides of vertical stabilizer, top of numbers located 12 inches below bottom of lower stripe. Top of numbers will be horizontally centered between the 10 percent chord front beam and the 64 percent rear chord beam.

**LOCAL STATION NUMBERS:** 12 inches (flat black). **Optional.** Last 4 digits of aircraft serial number, located on both sides of fuselage, top of numbers on stringer 12 on the left side and stringer 11 on the right of fuselage, forward edge of number 9 inches aft of nose seam.

**UNIT IDENTIFIER:** 10 inches (flat black). **Optional.** Both sides of fuselage, centered under local station number.

**AIR FORCE OUTSTANDING AWARD:** 3 inches by 12 inches (flat decal, contrasting grays or flat black), centered 3 inches above crew entry door. **Optional.**

**PILOT/CREW CHIEF/ASSISTANT NAMES:** (flat black). **Optional.** Names can be located on either side of the fuselage. Size and location determined by the unit. Placing names inside the aircraft will avoid removal and replacement prior to or after deployments.

**COMMAND MINUTEMAN INSIGNIA:** 34 inches (flat black or gray decal). **Optional.** Location: Both side of fuselage, top of emblem placed 2 inches below clear view window, aft most portion placed 2 inches forward of window centerline.

**STATE NAME:** 21inch (flat black), location: Centered on both sides of each main landing gear door.

**NATIONAL STAR INSIGNIA OUTLINE:** 36 inches (flat black). Both sides of fuselage, centered 59 inches aft of FS 1964 on WL 258.

**AIR NATIONAL GUARD:** 12 inches (flat black), location: centered on underside of fwd nose cargo door.

#### A6.7.9. C-17.

**Table A6.10. C-17.**

**UNITED STATES FLAG:** 24 inches by 48 inches (Matte). Both sides vertical stabilize. Bottom of flag located 42 inches above top edge of the of the upper tail band stripe, with the top forward corner of the flag located 1 inch from the VOR/LOC-2 antenna.

**ANG, TAIL MARKING:** 18 inches (flat black). Both sides of vertical stabilizer, bottom of letters located 12 inches above top edge of the top tail band stripe and centered on an (invisible) vertical line drawn parallel with vertical stabilizer trailing edge that intersects the center of the flag.

**TAIL BAND STRIPES:** (flat black) Two 2 inch stripes, top of upper stripe located at vertical stabilizer coordinate ZV 134. Top of lower stripe is located 18 inches below bottom of upper

stripe. Stripes run horizontally from aft edge of leading edge seam to trailing edge of rudder.

**RADIO CALL NUMBERS:** 12 inches (flat black). Both sides of vertical stabilizer, top of numbers located 12 inches below bottom of lower tail band stripe, centered on an invisible vertical line drawn parallel with the vertical stabilizer trailing edge, intersecting center of the flag.

**LOCAL STATION NUMBERS:** 18 inches (flat black). **Optional.** Last 4 digits of aircraft serial number, located on both sides of the fuselage, centered below the lower aft corner of the down view window, with the top of the numbers on fuselage coordinate Z-192.

**UNIT IDENTIFIER:** 10 inches (flat black). **Optional.** Both sides of fuselage, centered on the station number, top of numbers 6 inches below the bottom of the station number.

**ASSOCIATE UNIT IDENTIFIER:** 10 inches (flat black). **Optional** Both sides of the fuselage, centered on the unit identifier, top of numbers 6 inches below bottom of the unit designator.

**AIR FORCE OUTSTANDING AWARD:** 3 inches by 12 inches (flat decal, contrasting grays or flat black), centered 3 inches above crew entry door. **Optional.**

**PILOT/CREW CHIEF/ASSISTANT NAMES:** (flat black). **Optional.** Names can be located on either side of the fuselage. Size and location determined by the unit. Placing names inside the aircraft will avoid removal and replacement prior to or after deployments.

**COMMAND MINUTEMAN INSIGNIA:** 34 inches (flat black or gray decal). **Optional.** Both sides of fuselage, most forward edge of emblem located 3 inches aft of fuselage light ring, bottom tip of emblem almost touching longeron L-32, and even with top of crew entry door.

**STATE NAME:** Size TBD by unit (flat black), centered on both sides of main landing gear wheel well assembly.

**NATIONAL STAR INSIGNIA OUTLINE:** 30 inches (flat black); both sides of fuselage, centered on centerline of the aft fuselage formation light, with the insignia leading edge located 6 inches aft of the light.

**U.S. AIR FORCE MARKING:** 24 inches (flat black); both sides of fuselage, located 12 inches aft of fuselage station 27.200 and 35.38 inches above longeron 1-25.

#### A6.7.10. KC-135.

A6.7.10.1. Aircraft assigned to Hawaii and Alaska authorized tail marking configuration (HH or AK), in flat black, # 37038 on aircraft painted Equipment Excellence, color # 36173.

#### Table A6.11. KC-135.

**UNITED STATES FLAG:** 21 inches by 40 inches (Matte); both sides vertical stabilizer, bottom of flag on WL 447, centered between stabilizer leading and trailing edges, not to include rudder.

**ANG TAIL MARKING:** 12 inches (flat black); both sides of vertical stabilizer, centered between stabilizer leading and trailing edges, not including rudder.

**TAIL BAND STRIPES:** (flat black). **Optional.** Two inch upper strip grounded at WL 568.90, top of the lower 2-inch stripe located 12 inches below the bottom of the upper stripe. Unit tail

band applied at home station; will be completely contained within the black line area prescribed above.

**RADIO CALL NUMBERS:** 12 inches (flat black); both sides of vertical tail, top of numbers located 12 inches below ANG tail marking, centered between stabilizer leading and trailing edges, not including rudder.

**LOCAL STATION NUMBERS:** 6 inches (flat black) **Optional.** Last 4 digits of aircraft serial number, both sides of fuselage nose section. Locate according to T.O. 1C-135-8.

**UNIT IDENTIFIER:** 6 inches (flat black) **Optional;** both sides of fuselage centered 6 inches under station number.

**ASSOCIATE UNIT IDENTIFIER:** 6 inches (flat black). **Optional** Both sides of the fuselage. Located 6 inches below bottom and centered on the unit designator.

**AIR FORCE OUTSTANDING AWARD:** 3 inches by 12 inches (flat decal, contrasting grays or flat black) centered 3 inches above crew entry door. **Optional.**

**PILOT/CREW CHIEF/ASSISTANT NAMES:** (flat black) **Optional.** Names can be located on either side of the fuselage. Size and location determined by the unit. Placing names inside the aircraft will avoid removal and replacement prior to or after deployments.

**COMMAND MINUTEMAN INSIGNIA:** 34 inches (flat black or gray decal) **Optional;** both sides of fuselage, 16 inches aft of crew entry door, 6 inches below USAF markings.

**BOOM ELEVATORS:** 10 inches (Color # 36622). Highest numeric designator of station assigned centered on the underside of the left ruddervator and alpha designator (ANG) centered on underside of the right ruddervator. Top of both ruddervators marked in the obverse of the bottom.

#### A6.7.11. C-21.

#### Table A6.12. C-21.

**UNITED STATES FLAG:** 5 inches (Gloss) both sides of vertical stabilizer, 12 inches up from the top surface of the HF Antenna and 15.5 inches forward of the rudder attachment point.

**TAIL BAND and STRIPES:** 1 inch gloss gold stripes, 8 inch band w/gloss multi-colors, 6 inch gloss lettering. Both sides of the vertical and rudder. Lettering centrally located vertically and horizontally within the tail band parallel to the aircraft centerline. Tail band starts 2 inches below the US flag. Note: If tail band and stripes extends onto rudder area, rudder must be re-weighed and balanced IAW TO or aircraft manufacture instructions.

**ANG EMBLEM:** 12 inches placed on the left side of the forward fuselage, 5 inches below the corner of the windshield and centered between the edge on the entrance door and windshield.

**RADIO CALL NUMBERS:** 8 inches. Both sides of vertical stabilizer, 9 inches below lower surface of the HF antenna and 15.5 inches forward of the rudder.

**PILOT/CREW CHIEF NAMES:** 1 inch, gloss black. Pilots/crew chief names left nose landing gear door, 2 inches aft of forward edge.

#### A6.7.12. C-27J.

**Table A6.13. C-27J.**

UNITED STATES FLAG: 20 inches X 38 inches (Matte finish). Located on both sides vertical stabilizer and placed 10 inches above the top edge of the MAJCOM Designator. Should be horizontally centered between the vertical stabilizer leading edge and the rudder hinge point.
ANG, TAIL MARKING: 12 inches (37038) applied half way (centered) between the bottom and top edges of the vertical stabilizer. It should be horizontally centered between the vertical stabilizer leading edge and the rudder hinge.
TAIL BAND STRIPES: (37038) Two 2-inch stripes, 12 inches apart, running horizontally across the tail and the rudder. The top edge of the top stripe should be 10 inches below the bottom edge of the MAJCOM designator.
RADIO CALL NUMBERS: 10 inches (37038). Both sides of vertical stabilizer, top of numbers located 10 inches below bottom edge of the tail stripe. Numbers should be horizontally centered between the vertical stabilizer leading edge and the rudder hinge point.
NOSE CALL NUMBERS: 4 digits, 6 inches (37038) Optional. Location is below the pilot's window.
UNIT CALL NUMBERS/LETTERS: 6 inches (37038) Optional. Top of number/letter is located 6 inches from the bottom of the nose call number. Location is below the pilot's window.
AIR FORCE OUTSTANDING AWARD: 3 inches by 12 inches (flat decal, contrasting grays or flat black), centered 3 inches above crew entry door. Optional
PILOT/CREW CHIEF/ASSISTANT NAMES: (37038) Optional. Size and location determined by the unit. Placing names inside the aircraft will avoid removal and replacement prior to or after deployments.
COMMAND MINUTEMAN INSIGNIA: 30 inches, (flat black or gray decal) <b>Optional</b> . Both side of vertical stabilizer centered with the flag. The top of the emblem is 10 inches from the bottom of the call number.
STATE NAME: 10 inch (37038), Centered on the main landing gear pod horizontally and centered vertically as the APU exhaust will allow. Vertical placement should be symmetrical for both pods. (See Attachment 7 for examples)'

**A6.7.13. MQ-1.****Table A6.14. MQ-1.**

<b>ANG Command Insignia:</b> 10 inches (flat black vinyl).
Vertical: Top of insignia 4.5-inches below bottom-edge of antenna panel seam.
Horizontal: Centered between leading edge of wing and aft edge of satcom radome.
<b>Organizational Insignia:</b> 10 inches (flat black vinyl). (see note 1)
Vertical: Top edge of insignia 4.5 inches below bottom edge of antenna panel seam.
Horizontal: Centered between leading edge of wing and aft edge of satcom radome.

<b>Unit Designator:</b> 10 inches (flat black vinyl). (see note 1)
Centered vertically and horizontally on tail outboard surfaces; leveled perpendicular to tail plane trailing edge.
<b>Squadron Insignia/Patch:</b> 10 inches (flat black vinyl). (see note 1)
Vertical: Bottom edge of insignia 4.5 inches above chine line left side of fwd fuselage.
Horizontal: Centered between leading edge of wing and aft edge of forward satcom radome.
<b>Commander Flagship: Unit designator:</b> 12 inches (flat black with white shadow to aft side). Vertical: Top edge of marking 25 inches below top edge of stabilizer.
Horizontal: Centered between leading and trailing edge surfaces on upper vertical tail leveled parallel with tail stripe.
<b>Air Force Chevron:</b> 10 inches (flat black vinyl).
<b>Fuselage placement:</b> Located on left and right sides of aft fuselage.
Vertical: Approximately 6 inches above chine line.
Horizontal: 10 inches from trailing edge
<b>Wing placement:</b> Located on top of left wing and bottom of right wing.
Placement: Centered on chord line 8 feet from wing tip.
Alignment: Parallel to the main wing spar line.
<b>Tail Stripe:</b> 6 inches wide, located on outside of the left and right tail boards.
Vertical: Top edge of stripe 75 inches below top edge of installed tail board.
Alignment: Perpendicular to tail board trailing edge.
<b>Crew Names:</b> Up to 1.75-inch block letters (flat black vinyl)
<b>Pilot:</b> Located on left side of forward fuselage
Vertical: 1 inch below front satcom radome.
Horizontal: Centered between aft and forward edges of front satcom radome.
<b>Sensor Operator (SO):</b> Located on left side of forward fuselage
Vertical: Up to 3.25 inches below front satcom radome (0.5 inch below pilot name).
Horizontal: Left edge aligned with left edge of pilot name or centered under pilot name, which ever presents the most professional appearance based on individual name lengths.
<b>Crew Chief:</b> Located on right side of forward fuselage.
Vertical: 1 inch below front satcom radome
Horizontal: Centered between aft and forward edges of front satcom radome
<b>Assistant Crew Chief:</b> Located on right side of forward fuselage.
Vertical: Up to 3.25 inches below front satcom radome (0.5 inch below CC name).

Horizontal: Centered under CC name.
<b>Tail Number:</b> Located on the left and right sides of the aft fuselage. 1.5 inch block letters AF over 1.5 inch numbers (year designator) followed by 4 inch numbers (last three numbers in aircraft serial number) (Flat black vinyl).
<b>Propeller Tip Blade:</b> 4-inch band around blade tip (flat yellow paint).
*(Optional) U.S. AIR FORCE or "State" AIR GUARD: 7 inches (flat black), location: both sides of fuselage located between Air Force Chevron and Organization Insignia on the left side and between the Air Force Chevron and the ANG Command Patch on the right side. Both will be centered from top to bottom on the fuselage.

## A6.7.14. MQ-9.

**Table A6.15. MQ-9.**

<b>ANG Command Insignia:</b> 12 inches (flat black vinyl).
Vertical: Top of insignia 12-inches below bottom-edge of tail stripe on upper tails.
Horizontal: Centered between leading and trailing edges of upper tails with top edge perpendicular to trailing edge
<b>Organizational Insignia:</b> 10 inches (flat black vinyl)
Vertical: Bottom edge of insignia 4 inches above chine line right side of fwd fuselage.
Horizontal: Centered between leading edge of wing and aft edge of satcom radome
<b>Unit Designator:</b> 10 inch block letters (flat black vinyl)
Vertical: Bottom edge of "NY" 61 inches from base of upper tails.
Horizontal: Centered between leading and trailing edge surfaces on upper vertical tail perpendicular with satcom radome.
<b>Squadron Insignia/Patch:</b> 10 inches (flat black vinyl)
Vertical: Bottom edge of insignia 4 inches above chine line left side of fwd fuselage.
Horizontal: Centered between leading edge of wing and aft edge of satcom radome.
<b>Commander Flagship: Unit designator:</b> 10 inches (flat black with white shadow to aft side) Vertical: Bottom edge of "NY" 61 inches from base of upper tail. Horizontal: Centered between leading and trailing edge surfaces on upper vertical tail leveled parallel with tail stripe. 174FW Shadowed to the AFT side, 44 inches from the base of upper tail. Tail Number: 3.5 inch block letters AF over 3.5 inch numbers (year designator) followed by 8 inch numbers (last three numbers in aircraft serial number) (Flat black vinyl, shadowed white to the AFT) <b>Air Force Chevron: Fuselage placement:</b> 10 inches (flat black vinyl) Located on left and right sides of aft fuselage.
Vertical: 4 inches above chine line.
Horizontal: Centered between wing trailing edge and upper tail leading edge



<b>Wing placement:</b> Located on top of left wing and bottom of right wing.
Placement: Centered on chord line 12 feet from wing tip to outer edge of decal.
Alignment: Parallel to the main wing spar line.
<b>Tail Stripe:</b> 7 inches wide located on left and right upper tails.
Vertical: Top edge of stripe 4 inches below top edge of upper tails.
Horizontal: Perpendicular to tail trailing edge
<b>Aircrew Names:</b> 1.75-inch military block letters (flat black vinyl)
<b>Pilot:</b> Located on left side of forward fuselage.
Vertical: 2 inches below chine line.
Horizontal: Centered on satcom radome
<b>Sensor Operator (SO):</b> Located on left side of forward fuselage.
Vertical: 0.5 inches below pilot name.
Horizontal: Centered below pilot name.
<b>Ground Crew Names:</b> 1.75-inch military block letters (flat black vinyl)
<b>Crew Chief (CC):</b> Located on right side of forward fuselage
Vertical: 2 inches below chine line.
Horizontal: Starting at 26 inches forward of aft edge of satcom radome justified forward.
<b>Assistant Crew Chief (ACC):</b> Located on right side of forward fuselage
Vertical: 0.5 inches below CC name.
<b>Tail Number:</b> 3.5 inch block letters AF over 3.5 inch numbers (year designator) followed by 8 inch numbers (last three numbers in aircraft serial number) (Flat black vinyl)
Horizontal: Located on the left and right sides of the lower tail leveled 4 inches below fuselage.
Alignment: Centered between leading and trailing edge of rudder.
<b>Propeller Blade Tips:</b> 4-inch band around blade tips (flat yellow paint)
<b>A.6.16. B2 and F-22. External Marking will be applied IAW ACCI 21-105.</b> Hawaii F-22 aircraft are authorized to use the PACAF Tail Marking configuration “HH” on the aircraft. (See Attachment 7)

## Attachment 7

### TYPICAL ANG TAIL MARKING CONFIGURATIONS:

**A7.1.** The following illustrations are provided for units that operate C-130, C-27, KC-135, C-5, or C-17 aircraft, which better define standard marking authorized for ANG airlift aircraft that belong to different gaining commands. Special Mission aircraft are exempt from these requirements, and must be marked IAW AF Drawings for their mission. (Arctic, AFSOC, Rescue) Wing Commander options are authorized per Attachment 6.

#### A7.1.1. ANG Tail Marking Configurations for AMC/AETC Gained Units

##### A7.1.1.1. C-130 & C-27 ANG Tail Marking Configurations.

**Figure A7.1. C-130 & C-27 Equipment Excellence Gray Tail Scheme and Standard Markings.**



##### A7.1.1.2. KC-135 ANG Tail Marking Configurations.

**Figure A7.2. KC-135 Equipment Excellence Gray Tail Scheme and Standard Markings.**



##### A7.1.1.3. C-5, C-17 ANG Tail Marking Configurations.

**Figure A7.3. C-5, C-17 Equipment Excellence Gray Tail Scheme and Standard Markings.**



A7.1.1.4. State Name Marking Sample. This marking is authorized on all C-130, C-5, C-17 & C-27 aircraft. Length, width and height will vary with each aircraft.

**Figure A7.4. State Name Marking Sample.**



A7.1.2. PACAF gained (Hawaii or Alaska) Optional tail markings

A7.1.2.1. Typical Tail Marking Configuration

**Figure A7.5. KC-135 Equipment Excellence Tail Scheme.**



A7.1.2.2. Optional Tail Marking Configuration

**Figure A7.6. Optional tail marking (Example Only).**



**A7.2.** F-16, F-15 A-10 and F-22 aircraft radio call numbers must not be moved or altered when a 2-digit Unit Designator is applied or shadowed on Wing designated aircraft. Two tone camouflage patterns will not be altered without SPD approval. This rule also applies when Tail Art is applied. Non-standard markings must be approved by the Wing Commander, in writing and kept on file at the unit.

Attachment 8

COATING GRID CHECK CHECKSHEET

Figure A8.1. Coating Grid Check Checksheet.

# COATING GRID CHECK

**STRIP** ☐

(>15 MILS)

**SCUFF** ☐

(<15 MILS)

STRIP LIP? YES ☐

NO ☐

INTAKE NOTES

INSPECTED BY:

DATE

AIRCRAFT NO

**Attachment 9****F-22 OUTER MOLD LINE AUDIT**

**A9.1.** The Low Observables Section is responsible to perform a Signature Assessment System (SAS) and aircraft Outer Mold Line (OML) audit on each assigned aircraft annually. The audit is used to confirm that damage defects entered in the SAS during daily OML inspections or damages removed from SAS during routine maintenance provide for an accurate representation of the LO system health. This can only be performed by physically matching aircraft damages with the entries in SAS. Errors identified during the audit must be recorded in the audit historical file and corrected in the SAS immediately. Any aircraft audit that results in a +15% or -15% SAS margin deviation indicates a potential deficiency with the OML inspection process. Maintenance supervisors with direct oversight of LO processes must ensure significant variances are understood and corrective actions, e.g. training, additional QA oversight, process changes, etc. immediately follow. Internal root cause analysis and corrective actions must be documented for historical purposes any time an audit exceeds the margin percentages outlined above. Units must also establish a local SAS management policy that outlines the frequency of QA evaluations to ensure SAS data for each aircraft is accurate. Note: There is an unacceptable risk to aircraft radar cross section and aircraft survivability due to substandard maintenance practices or inaccurate maintenance documentation into the SAS. Aircraft scheduled for an audit should be identified during the monthly/weekly shared resources meeting.

A9.1.1. All aircraft scheduled to support a Theater Security Package/contingency deployment must not have an audit due within 30 days of arriving at the deployed location.

**A9.2.** The following equipment is required to perform SAS margin audit:

A9.2.1. Miltope or Portable Maintenance Aid (PMA)

A9.2.2. Sharpie

A9.2.3. Pen or pencil

A9.2.4. Fuselage station butt line chart

A9.2.5. Roll of tape (blue 3M 2090)

A9.2.6. Booties

**A9.3.** The SAS and OML Audit historical files: The SAS and OML audit files will be maintained for 5 years. Each audit file will include at a minimum:

A9.3.1. Name of person/s performing the audit

A9.3.2. Date of audit

A9.3.3. Pre-audit SAS margin percentage using sector with the highest number

A9.3.4. Post-audit SAS margin percentage using sector with greatest change, except in the case where a decrease in margin is greater than an increase in any sector. Sector increases are always more critical than sector decreases

A9.3.5. Number of new damages identified

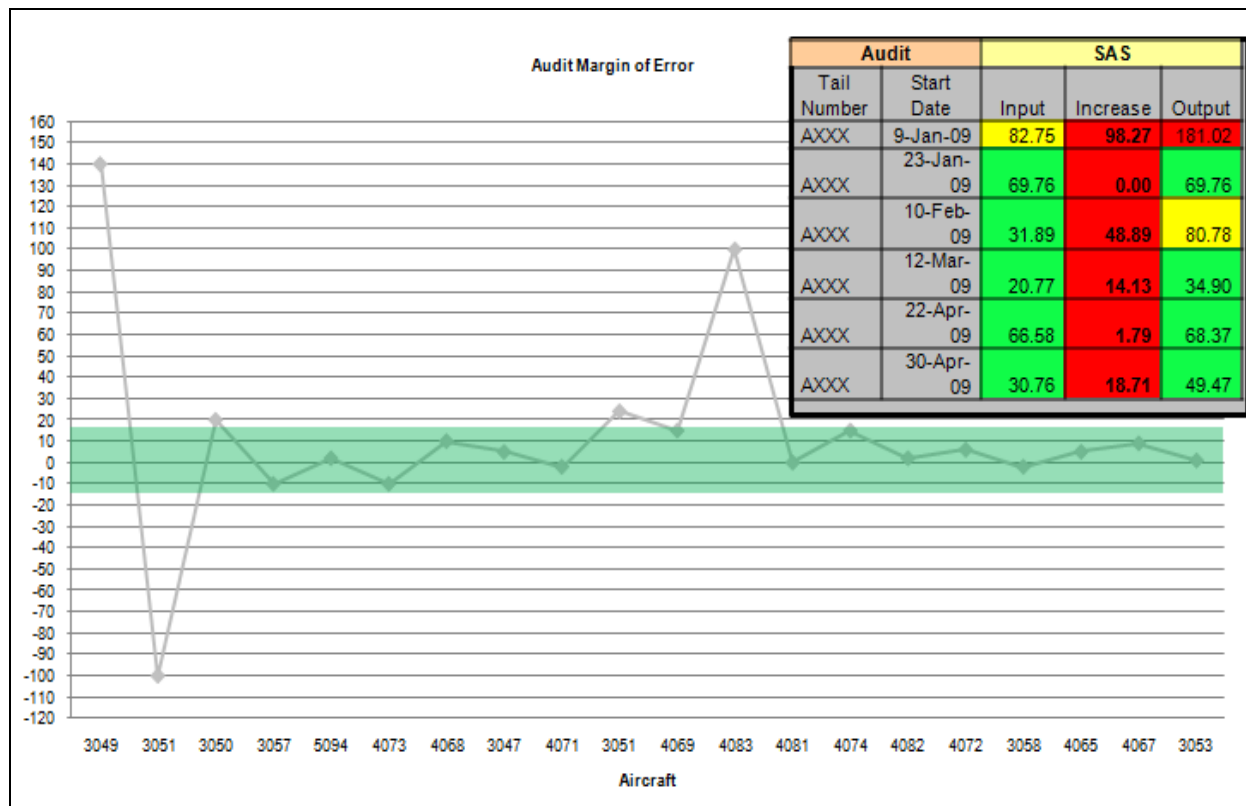
A9.3.6. Number of previously repaired damages that were not removed from SAS

A9.3.7. Number of duplicate entries identified

A9.3.8. Root cause and corrective action when post audit results in a +15% or -15% change

A9.3.9. An audit metric (Figure 4.1) will be created and used to monitor OML inspection compliance.

**Figure A9.1. Audit Metric.**

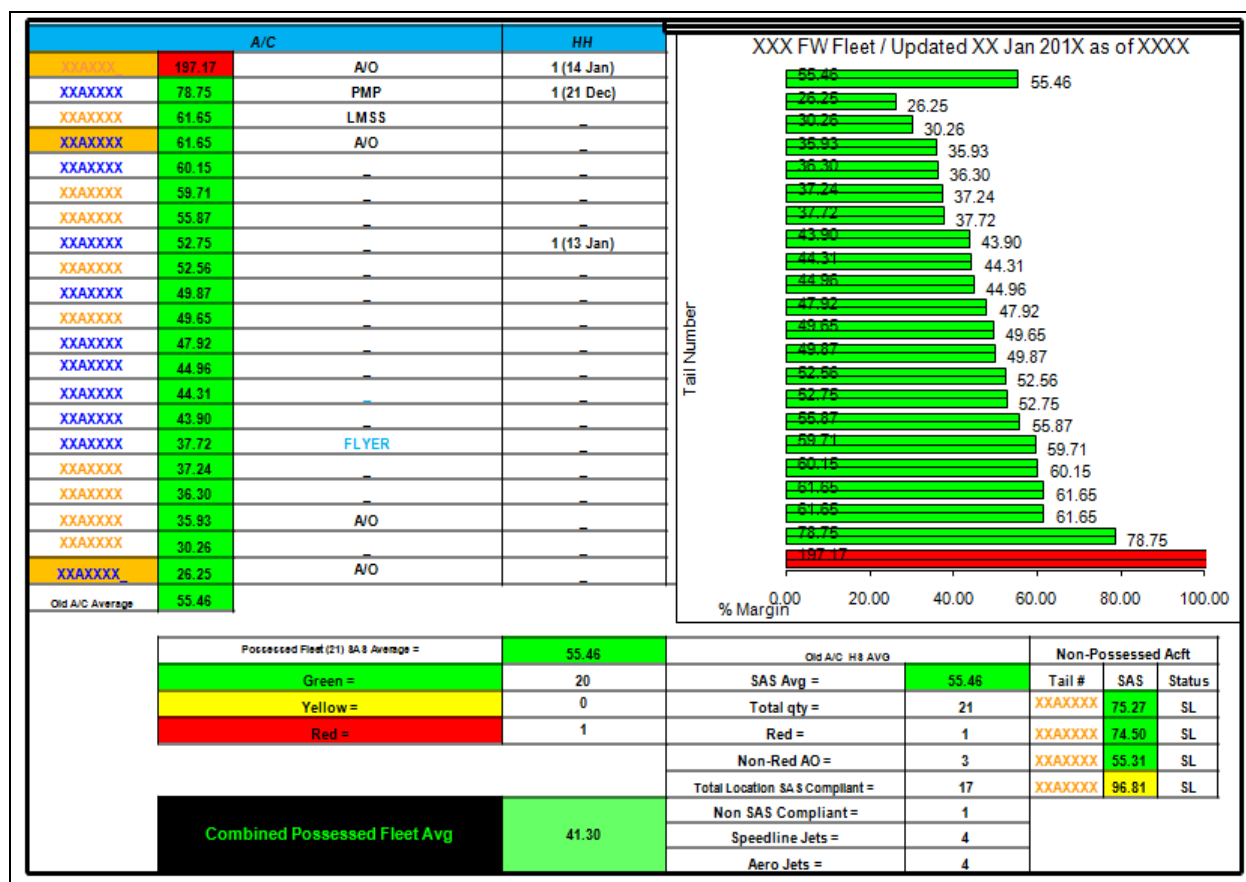


## Attachment 10

## DAILY SAS REPORTING METRICS

**A10.1.** Fleet SAS margin numbers must be documented in a format similar to the chart below. Key information includes SAS margin number for each aircraft, fleet SAS average and number of aero only panels. Fleet SAS average reported must not include non-possessed aircraft. This information must be disseminated within the wing MXG as required, NGB/A4M WSM, and MAJCOM F-22 Weapon System Team at least weekly.

Figure A10.1. Daily SAS Reporting Metrics.



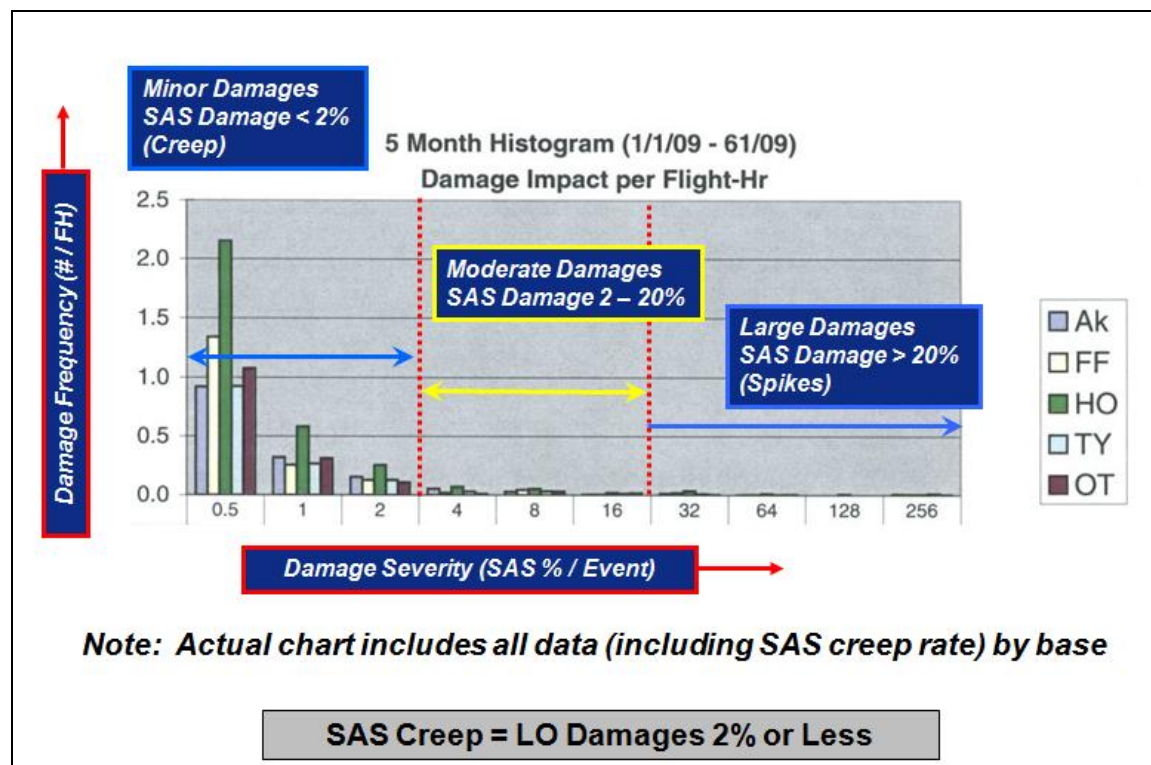


## Attachment 11

## SAS CREEP DESCRIPTION

**A11.1.** The chart below shows a categorization approach to optimize maintenance activities. It outlines three categories of damages, those with an impact greater than 20% (major “spikes”), those between 2% and 20% (moderate “routine”) and those less than 2% (minor “creep”). Post flight OML inspections accomplished by the crew chief and/or LO personnel must identify any LO spike damages as soon as possible after flight if the aircraft is on the next day flying schedule.

**Figure A11.1. SAS Creep.**



A11.1.1. The damage definition/SAS creep metric must be used to establish a battle rhythm for managing LO maintenance. Minor damages are repaired through scheduled SAS redux. Moderate damages should primarily be worked in groups in conjunction with other scheduled maintenance, e.g. Packaged Maintenance Plans, TCTOs, and panel removals to facilitate other maintenance. Any existing moderate damages should be the priority when performing scheduled SAS reduction efforts. Large damages that drive significant increases in SAS must be fixed as soon as possible to manage SAS growth. In some cases it may be prudent to define large damages as >10 percent to effectively control SAS margins. This more aggressive approach is particularly beneficial prior to major deployments. Units have the option to define spikes as >10% if necessary to control spike growth, but the SAS creep definition provided above must be used in all cases.

A11.1.2. Use wing analysis and scheduling experts to help balance flying operations and LO maintenance events/downtime to best manage LO fleet health. Failure to effectively balance flying and LO maintenance requirements could lead to an uncontrollable LO backlog.

**A11.2. Canopy Transparency Coating Tracking.** Canopy coating data is tracked by AF Engineering Technical Services, Field Service Representatives or Contract Engineering Technical Services in a format similar to the chart below. The tracking sheet must also include transparency manufacture and damage information by placing a flag note in each block used to track canopy hours. This data is tracked to help units predict reliability. Canopy data must be disseminated to MXG supervisors, MAJCOM weapon system team and the LM canopy IPT at least weekly.

**Figure A11.2. Canopy Transparency Coating Tracking.**

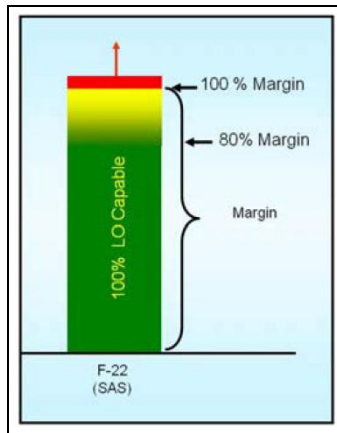
A/C	CANOPY HOURS	Visual Status	A/C	CANOPY HOURS	Visual Status	A/C	CANOPY HOURS	Visual Status	A/C	CANOPY HOURS	Visual Status
05-090	260.7	8	06-118	154.3	9	07-131	92.7		07-142	193	20
05-102	95.7		06-119	8.5	1	07-133	49.4		07-143	143	4
05-103	3.6		06-121	184.5	6	07-134	62.4		07-144	147.9	3
06-108	273	3	06-122	397		07-135	158		07-145	108.7	
06-110	73.5	2	06-123	192.9	12	07-136	85		07-146	214.1	6
06-112	76.3					07-137	23.8		07-147	293.1	15
06-113	189.1	4	06-126	148.7	2	07-138	179.4	2	07-148	283.8	10
06-114	380.3	10	06-127	112	5	07-139	75.7		07-149	139.8	2
06-115	152.6		06-129	114.5		07-140	167.7	25	07-150	96.7	2
06-117	111.3	1	06-130	58.8	1	07-141	119.4	6	07-151	173.7	31
Canopy Hours			Visual Status								
1-99.9 Hours											
100 - 199.9 Hours											
200+ - Hours											
									</		

## Attachment 12

## SAS MARGIN DEFINITION

**A12.1.** The graphic below depicts the SAS margin scale used to determine mission capable status for the F-22 LO system.

**Figure A12.1. SAS Margin.**



A12.1.1. The LO margin for each aircraft is determined via outer mold line (OML) inspection and use of SAS. An aircraft is fully mission capable for the LO system when the SAS margin is less than or equal to 100 percent. LO restoration is required when 100 percent SAS margin exceeded.

A12.1.2. Manage fleet LO by taking advantage of opportunistic downtime or scheduling LO restoration time when RCS margin approaches unit determined threshold (typically around 80%). Fleet SAS margin averages should be maintained at or below 60 percent during peace time operations to effectively manage SAS margin growth. Utilize a SAS top 5/10 priority list or SAS priority screen to schedule LO maintenance events. Any top 5/10 priority list must be kept current for other opportunities such as FOM work, aero-coated panel restoration if aircraft is down, complete concurrent spike and moderate damage repairs.

A12.1.3. SAS does not rank-order aircraft in terms of RCS.

A12.1.4. SAS number does not correlate to an RCS pattern.

A12.1.5. SAS is not a mission planning tool.